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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1882

FIRST EDITION

PUBLISHED BY AUTHORITY OF THE SECRETARY OF THE NAVY

WASHINGTON
BUREAU OF NAVIGATION
1879

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(1882.)

PREFACE.

THE contents of the present volume of the *American Ephemeris*, though substantially unchanged in their general character, have, in some parts, undergone material alterations in their form and arrangement. The arrangement of the work is now as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, gives the positions of all the bodies of the solar system and other fundamental astronomical data for equidistant intervals of Greenwich mean time. The principal change made in it has been the transfer of the sun's co-ordinates and of the geocentric ephemerides of Mercury, Uranus, and Neptune from Part II, and the addition of accurate heliocentric positions of all the planets.

Part II, *Ephemeris for the Meridian of Washington*, gives principally ephemerides of the fixed stars, sun, moon, and major planets for transit over the meridian of Washington. The mean places of the fixed stars and data for their reduction are also included in this part. The list of mean places of fixed stars has been greatly enlarged, for the convenience of field-astronomers.

Part III, *Phenomena*, contains predictions of phenomena to be observed with data for their computation. Washington mean time is used in this part except in a few cases, notably that of eclipses, where Greenwich mean time was judged more convenient. The additions comprise more complete data for eclipses of the sun, diagrams showing the configurations of the satellites of Jupiter, data respecting the disks of Mercury and Venus for the reduction of meridian and photometric observations, and diagrams, with tables, for identifying any known satellites of other planets.

SIMON NEWCOMB,
Professor U. S. Navy, Superintendent.

WASHINGTON, *September* 3, 1879.

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CORRECTIONS.

EPHEMERIS FOR 1881 (FIRST EDITION).

(*Continued from page* VI *of the first edition of the Ephemeris for* 1881.)

Page 43,	Monday 7, last hour,	*for* 22	*read* 23
241,	apparent declination, November 7,	*for* $4''.2$	*read* $14''.2$
241,	apparent right ascension, November 25,	*for* $33^s.31$	*read* $33^s.21$
257,	f, (in time), December 31,	*for* $4^s.080$	*read* $4^s.089$
258,	last line,	*for* $+0''.0008 \sin 2\Gamma'$	*read* $+0''.0008 \cos 2\Gamma'$
262,	γ Cygni, $20^h 17^m$, An. Variation declination,	*for* $11''.521$	*read* $11''.349$
286,	ν Orionis, correction to declination throughout the year $= +3''.4$		
288,	δ Geminorum, correction to right ascension,	June 18—July 8	$= +\overset{s}{0}.01$
		July 18—August 17	$= +0.02$
		August 27—December 15	$= +0.03$
		December 25—December 34	$= +0.02$
317,	γ Cygni, declination, December 35.1,	*for* $55''.6$	*read* $56''.6$
325,	ι Piscium, correction to right ascension,	March 11—September 26	$= +\overset{s}{0}.01$
		October 6—December 35	$= +0.02$
332,	April 7, mean time of meridian transit,	*for* 6^h	*read* 7^h
369,	December 29, 30, 31, increase apparent declination for meridian transit by $1'$.		
481,	first column,	*for* Lehigh	*read* Bethlehem
482,	first column,	*for* Marbury	*read* Marburg
482,	Princeton, latitude,	*for* $21' 47''$	*read* $20' 58''$
492,	last line,	*for* $0^s.00$	*read* $0^s.02$
500,	line seventeen from bottom, (15),	*for* log u'	*read* log μ'
501,	line five, (51),	*for* t_2	*read* t_1
501,	line thirteen,	*for* log $c_1 \cos C_2$	*read* log $c_1 \cos C_1$

EPHEMERIS FOR 1882 (FIRST EDITION).

Pages 218, 222, 223.—The declinations of Mercury at certain times require corrections which may be interpolated from the following values:—

1882, February	4	$\Delta\delta = +0''.1$
	15	. . . $+0.5$
	25	. . . 0.0
September	26	. . . 0.0
October	13	. . . -0.4
	24	. . . 0.0
November	1	. . . $+0.6$
	15	. . . 0.0

Pages 250—255.—The daily motions of the heliocentric longitudes and latitudes of Mercury, and of the heliocentric latitudes of Venus, are not strictly the differential coefficients for the given dates; but are nearly the mean motions during the two days preceding and following, an erroneous correction for third differences having been applied.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1882, WHICH COMPRISES THE LATTER PART OF THE 106TH AND THE BEGINNING OF THE 107TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6595 of the Julian Period;
" 7390–91 of the Byzantine era, the year 7391 commencing September 1;
" 5642–43 of the Jewish era, the year 5643 commencing on September 14th, or, more exactly, at sunset on September 13;
" 2635 since the foundation of Rome, according to VARRO;
" 2629 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period: corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of CHRIST;
" 2658 of the Olympiads, or the second year of the 665th Olympiad commencing in July, 1882, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;
" 2194 of the Grecian era, or the era of the Seleucidæ;
" 1598 of the era of DIOCLETIAN.

The year 1300 of the Mohammedan era, or the era of the Hegira, begins on the 12th day of November, 1882.

The first day of January of the year 1882 is the 2,408,447th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	A	Solar Cycle	15
Epact	11	Roman Indiction	10
Lunar Cycle or Golden Number	2	Julian Period	6595

EPH 82—VII

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring signs.	1.	♈	Aries.	Autumn signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer signs.	4.	♋	Cancer.	Winter signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌ Conjunction, or having the same Longitude or Right Ascension.

□ Quadrature, or differing 90° in Longitude or Right Ascension.

☍ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sun.	1	18 48 2.57	11.036	S. 22 59 37.6	+12.66	16 18.39	71.07	3 53.49	1.175
Mon.	2	18 52 27.24	11.020	22 54 20.1	13.81	16 18.38	71.03	4 21.53	1.160
Tues.	3	18 56 51.55	11.004	22 48 35.2	14.94	16 18.38	70.98	4 49.19	1.144
Wed.	4	19 1 15.45	10.987	22 42 23.1	+16.07	16 18.37	70.92	5 16.46	1.127
Thur.	5	19 5 38.93	10.968	22 35 44.1	17.20	16 18.35	70.86	5 43.30	1.108
Frid.	6	19 10 1.96	10.949	22 28 38.1	18.31	16 18.32	70.80	6 9.71	1.089
Sat.	7	19 14 24.53	10.929	22 21 5.6	+19.41	16 18.29	70.73	6 35.64	1.069
Sun.	8	19 18 46.59	10.909	22 13 6.6	20.50	16 18.26	70.66	7 1.08	1.049
Mon.	9	19 23 8.13	10.887	22 4 41.6	21.58	16 18.21	70.59	7 26.00	1.027
Tues.	10	19 27 29.13	10.864	21 55 50.6	+22.66	16 18.16	70.51	7 50.38	1.004
Wed.	11	19 31 49.58	10.840	21 46 33.9	23.73	16 18.11	70.43	8 14.20	0.980
Thur.	12	19 36 9.44	10.816	21 36 51.6	24.78	16 18.05	70.35	8 37.45	0.956
Frid.	13	19 40 28.69	10.790	21 26 44.2	+25.82	16 17.98	70.26	9 0.09	0.930
Sat.	14	19 44 47.32	10.764	21 16 12.0	26.85	16 17.91	70.17	9 22.10	0.904
Sun.	15	19 49 5.31	10.736	21 5 15.2	27.87	16 17.84	70.08	9 43.47	0.876
Mon.	16	19 53 22.64	10.707	20 53 54.1	+28.87	16 17.76	69.98	10 4.19	0.848
Tues.	17	19 57 39.27	10.678	20 42 9.2	29.85	16 17.68	69.88	10 24.21	0.819
Wed.	18	20 1 55.19	10.648	20 30 0.6	30.82	16 17.59	69.78	10 43.51	0.789
Thur.	19	20 6 10.38	10.618	20 17 28.9	+31.79	16 17.50	69.68	11 2.09	0.759
Frid.	20	20 10 24.83	10.586	20 4 34.2	32.74	16 17.41	69.58	11 19.93	0.727
Sat.	21	20 14 38.50	10.554	19 51 17.1	33.67	16 17.31	69.48	11 37.01	0.695
Sun.	22	20 18 51.40	10.521	19 37 37.9	+34.59	16 17.21	69 37	11 53.31	0.662
Mon.	23	20 23 3.51	10.488	19 23 36.9	35.48	16 17.11	69.26	12 8.82	0.629
Tues.	24	20 27 14.82	10.454	19 9 14.4	36.37	16 17.00	69.15	12 23.52	0.595
Wed.	25	20 31 25.30	10.419	18 54 31.0	+37.23	16 16.89	69.04	12 37.41	0.561
Thur.	26	20 35 34.95	10.385	18 39 27.1	38.08	16 16.77	68.93	12 50.48	0.527
Frid.	27	20 39 43.79	10.350	18 24 3.0	38.91	16 16.65	68.82	13 2.73	0.492
Sat.	28	20 43 51.79	10.315	18 8 19.0	+39.74	16 16.53	68.70	13 14.14	0.457
Sun.	29	20 47 58.94	10.280	17 52 15.6	40.54	16 16.40	68.59	13 24.70	0.422
Mon.	30	20 52 5.25	10.246	17 35 53.0	41.33	16 16.26	68.47	13 34.43	0.388
Tues.	31	20 56 10.74	10.211	17 19 11.8	42.08	16 16.12	68.36	13 43.34	0.353
Wed.	32	21 0 15.39	10.176	S. 17 2 12.5	+42.83	16 15.98	68.24	13 51.41	0.318

Note.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sun.	1	18 48 1.85	11.032	S. 22 59 38.4	+12.65	3 53.41	1.175	18 44 8.44
Mon.	2	18 52 26.44	11.017	22 54 21.1	13.80	4 21.44	1.160	18 48 5.00
Tues.	3	18 56 50.66	11.001	22 48 36.4	14.93	4 49.10	1.144	18 52 1.56
Wed.	4	19 1 14.48	10.984	22 42 24.6	+16.06	5 16.36	1.127	18 55 58.12
Thur.	5	19 5 37.88	10.965	22 35 45.8	17.19	5 43.20	1.108	18 59 54.68
Frid.	6	19 10 0.83	10.946	22 28 40.1	18.30	6 9.60	1.089	19 3 51.23
Sat.	7	19 14 23.32	10.926	22 21 7.8	+19.40	6 35.53	1.069	19 7 47.79
Sun.	8	19 18 45.31	10.906	22 13 9.1	20.49	7 0.96	1.049	19 11 44.35
Mon.	9	19 23 6.78	10.884	22 4 44.3	21.57	7 25.87	1.027	19 15 40.91
Tues.	10	19 27 27.71	10.861	21 55 53.6	+22.66	7 50.25	1.004	19 19 37.46
Wed.	11	19 31 48.09	10.837	21 46 37.2	23.72	8 14.07	0.980	19 23 34.02
Thur.	12	19 36 7.89	10.813	21 36 55.2	24.77	8 37.31	0.956	19 27 30.58
Frid.	13	19 40 27.08	10.787	21 26 48.1	+25.81	8 59.94	0.930	19 31 27.14
Sat.	14	19 44 45.65	10.761	21 16 16.2	26.84	9 21.96	0.904	19 35 23.69
Sun.	15	19 49 3.58	10.733	21 5 19.7	27.86	9 43.33	0.876	19 39 20.25
Mon.	16	19 53 20.85	10.705	20 53 58.9	+28.86	10 4.05	0.848	19 43 16.80
Tues.	17	19 57 37.42	10.676	20 42 14.3	29.84	10 24.06	0.819	19 47 13.36
Wed.	18	20 1 53.29	10.646	20 30 6.1	30.81	10 43.37	0.789	19 51 9.92
Thur.	19	20 6 8.43	10.616	20 17 34.7	+31.78	11 1.95	0.759	19 55 6.48
Frid.	20	20 10 22.83	10.584	20 4 40.4	32.73	11 19.80	0.727	19 59 3.03
Sat.	21	20 14 36.46	10.552	19 51 23.6	33.66	11 36.87	0.695	20 2 59.59
Sun.	22	20 18 49.32	10.519	19 37 44.7	+34.58	11 53.18	0.662	20 6 56.14
Mon.	23	20 23 1.39	10.486	19 23 44.0	35.47	12 8.69	0.629	20 10 52.70
Tues.	24	20 27 12.66	10.452	19 9 21.9	36.36	12 23.40	0.595	20 14 49.26
Wed.	25	20 31 23.11	10.418	18 54 38.8	+37.22	12 37.29	0.561	20 18 45.82
Thur.	26	20 35 32.74	10.384	18 39 35.3	38.07	12 50.37	0.527	20 22 42.37
Frid.	27	20 39 41.55	10.349	18 24 11.5	38.90	13 2.62	0.492	20 26 38.93
Sat.	28	20 43 49.52	10.314	18 8 27.8	+39.73	13 14.04	0.457	20 30 35.48
Sun.	29	20 47 56.65	10.279	17 52 24.7	40.53	13 24.61	0.422	20 34 32.04
Mon.	30	20 52 2.94	10.245	17 36 2.4	41.32	13 34.35	0.388	20 38 28.59
Tues.	31	20 56 8.41	10.210	17 19 21.5	42.07	13 43.26	0.353	20 42 25.15
Wed.	32	21 0 13.04	10.175	S. 17 2 22.4	+42.82	13 51.34	0.318	20 46 21.70

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
+ 9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	1	281 2 49.0	2 32.2	152.86	+ 0.41	9.9926628	− 0.5	5 14 59.80
2	2	282 3 57.4	3 40.4	152.86	0.28	9.9926628	+ 0.6	5 11 3.88
3	3	283 5 5.6	4 48.4	152.86	0.16	9.9926656	1.8	5 7 7.97
4	4	284 6 13.7	5 56.3	152.85	+ 0.06	9.9926713	+ 3.0	5 3 12.07
5	5	285 7 21.7	7 4.1	152.84	− 0.04	9.9926799	4.1	4 59 16.16
6	6	286 8 29.5	8 11.8	152.83	0.11	9.9926913	5.3	4 55 20.25
7	7	287 9 37.2	9 19.3	152.83	− 0.16	9.9927054	+ 6.4	4 51 24.34
8	8	288 10 44.8	10 26.8	152.82	0.17	9.9927224	7.6	4 47 28.42
9	9	289 11 52.4	11 34.2	152.82	0.16	9.9927421	8.7	4 43 32.51
10	10	290 12 59.9	12 41.6	152.81	− 0.11	9.9927644	+ 9.8	4 39 36.60
11	11	291 14 7.4	13 48.9	152.81	− 0.05	9.9927891	10.8	4 35 40.69
12	12	292 15 14.8	14 56.1	152.80	+ 0.03	9.9928160	11.7	4 31 44.78
13	13	293 16 22.1	16 3.2	152.80	+ 0.15	9.9928451	+ 12.5	4 27 48.87
14	14	294 17 29.1	17 10.1	152.79	0.27	9.9928762	13.3	4 23 52.96
15	15	295 18 35.9	18 16.8	152.78	0.40	9.9929092	14.1	4 19 57.05
16	16	296 19 42.4	19 23.1	152.76	+ 0.54	9.9929439	+ 14.8	4 16 1.15
17	17	297 20 48.5	20 29.0	152.74	0.67	9.9929804	15.5	4 12 5.23
18	18	298 21 54.0	21 34.3	152.71	0.78	9.9930185	16.2	4 8 9.32
19	19	299 22 58.9	22 39.1	152.69	+ 0.87	9.9930582	+ 16.9	4 4 13.41
20	20	300 24 3.2	23 43.3	152.66	0.93	9.9930994	17.5	4 0 17.50
21	21	301 25 6.8	24 46.7	152.63	0.97	9.9931421	18.2	3 56 21.59
22	22	302 26 9.5	25 49.2	152.59	+ 0.98	9.9931864	+ 18.8	3 52 25.68
23	23	303 27 11.2	26 50.8	152.55	0.95	9.9932323	19.5	3 48 29.77
24	24	304 28 11.9	27 51.4	152.50	0.90	9.9932798	20.2	3 44 33.85
25	25	305 29 11.4	28 50.8	152.45	+ 0.82	9.9933291	+ 21.0	3 40 37.93
26	26	306 30 9.7	29 48.9	152.40	0.72	9.9933803	21.8	3 36 42.02
27	27	307 31 6.8	30 45.8	152.35	0.59	9.9934334	22.6	3 32 46.11
28	28	308 32 2.7	31 41.6	152.30	+ 0.46	9.9934886	+ 23.5	3 28 50.21
29	29	309 32 57.3	32 36.1	152.25	0.33	9.9935460	24.4	3 24 54.29
30	30	310 33 50.6	33 29.3	152.19	0.19	9.9936056	25.4	3 20 58.38
31	31	311 34 42.6	34 21.1	152.14	+ 0.06	9.9936676	26.4	3 17 2.47
32	32	312 35 33.4	35 11.7	152.09	− 0.05	9.9937321	+ 27.4	3 13 6.58

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 16.1	15 12.2	55 55.1	− 1.20	55 41.1	− 1.15	9 59.4	2.17	11.3
2	15 8.6	15 5.1	55 27.7	1.09	55 15.0	1.03	10 51.2	2.13	12.3
3	15 1.9	14 58.9	55 3.1	0.96	54 52.0	0.89	11 41.6	2.06	13.3
4	14 56.1	14 53.5	54 41.7	− 0.83	54 32.2	− 0.75	12 30.1	1.97	14.3
5	14 51.2	14 49.2	54 23.8	0.66	54 16.5	0.56	13 16.3	1.88	15.3
6	14 47.6	14 46.3	54 10.5	0.44	54 5.9	0.32	14 0.4	1.80	16.3
7	14 45.5	14 45.0	54 2.7	− 0.19	54 1.2	− 0.05	14 42.8	1.74	17.3
8	14 45.2	14 45.8	54 1.6	+ 0.11	54 4.0	+ 0.28	15 24.2	1.71	18.3
9	14 47.0	14 48.9	54 8.5	0.46	54 15.2	0.66	16 5.4	1.72	19.3
10	14 51.3	14 54.5	54 24.3	+ 0.86	54 35.8	+ 1.06	16 47.1	1.77	20.3
11	14 58.2	15 2.7	54 49.7	1.26	55 6.1	1.47	17 30.4	1.86	21.3
12	15 7.8	15 13.6	55 24.8	1.66	55 45.9	1.85	18 16.3	1.98	22.3
13	15 19.9	15 26.7	56 9.1	+ 2.02	56 34.3	+ 2.17	19 5.4	2.13	23.3
14	15 34.0	15 41.7	57 1.1	2.30	57 29.3	2.39	19 58.4	2.29	24.3
15	15 49.6	15 57.6	57 58.3	2.43	58 27.5	2.42	20 55.2	2.44	25.3
16	16 5.4	16 13.0	58 56.4	+ 2.37	59 24.3	+ 2.26	21 54.9	2.53	26.3
17	16 20.1	16 26.5	59 50.4	2.08	60 14.0	1.85	22 56.0	2.54	27.3
18	16 32.1	16 36.6	60 34.4	1.56	60 51.1	1.22	23 56.5	2.49	28.3
19	16 40.0	16 42.1	61 3.5	+ 0.84	61 11.2	+ 0.44	☌		29.3
20	16 42.9	16 42.4	61 14.1	+ 0.04	61 12.1	− 0.36	0 55.2	2.39	0.8
21	16 40.5	16 37.5	61 5.4	− 0.74	60 54.3	1.08	1 51.4	2.29	1.8
22	16 33.4	16 28.4	60 39.3	− 1.39	60 20.9	− 1.65	2 45.4	2.21	2.8
23	16 22.7	16 16.4	59 59.8	1.85	59 36.6	2.00	3 37.7	2.16	3.8
24	16 9.6	16 2.7	59 11.9	2.10	58 46.5	2.14	4 29.2	2.14	4.8
25	15 55.8	15 48.9	58 20.9	− 2.13	57 55.6	− 2.10	5 20.5	2.14	5.8
26	15 42.1	15 35.6	57 30.8	2.03	57 7.0	1.93	6 12.1	2.16	6.8
27	15 29.5	15 23.7	56 44.4	1.82	56 23.2	1.70	7 4.0	2.17	7.8
28	15 18.3	15 13.3	56 3.4	− 1.59	55 45.1	− 1.46	7 56.1	2.16	8.8
29	15 8.8	15 4.6	55 28.4	1.33	55 13.2	1.21	8 47.6	2.13	9.8
30	15 0.9	14 57.6	54 59.5	1.08	54 47.3	0.96	9 37.9	2.06	10.8
31	14 54.7	14 52.1	54 36.5	0.84	54 27.1	0.73	10 26.6	1.98	11.8
32	14 49.9	14 48.0	54 19.0	− 0.62	54 12.2	− 0.52	11 13.3	1.90	12.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SUNDAY 1.					TUESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 22 30.76	2.2677	N.21 41 28.7	2.344	0	6 10 6.04	2.1943	N.21 21 10.6	3.093
1	4 24 46.81	2.2674	21 43 45.9	2.227	1	6 12 17.62	2.1916	21 18 1.9	3.198
2	4 27 2.85	2.2671	21 45 56.0	2.110	2	6 14 29.03	2.1888	21 14 46.9	3.303
3	4 29 18.87	2.2668	21 47 59.1	1.993	3	6 16 40.27	2.1859	21 11 25.6	3.407
4	4 31 34.87	2.2664	21 49 55.2	1.877	4	6 18 51.34	2.1831	21 7 58.1	3.509
5	4 33 50.84	2.2660	21 51 44.3	1.760	5	6 21 2.24	2.1802	21 4 24.5	3.611
6	4 36 6.79	2.2655	21 53 26.4	1.643	6	6 23 12.96	2.1772	21 0 44.8	3.712
7	4 38 22.70	2.2649	21 55 1.5	1.526	7	6 25 23.50	2.1742	20 56 59.0	3.814
8	4 40 38.58	2.2643	21 56 29.5	1.409	8	6 27 33.86	2.1712	20 53 7.1	3.915
9	4 42 54.42	2.2637	21 57 50.5	1.292	9	6 29 44.04	2.1681	20 49 9.2	4.015
10	4 45 10.22	2.2629	21 59 4.5	1.175	10	6 31 54.03	2.1649	20 45 5.3	4.114
11	4 47 25.97	2.2621	22 0 11.5	1.058	11	6 34 3.83	2.1618	20 40 55.5	4.213
12	4 49 41.67	2.2612	22 1 11.5	0.942	12	6 36 13.45	2.1587	20 36 39.7	4.312
13	4 51 57.32	2.2603	22 2 4.5	0.825	13	6 38 22.88	2.1555	20 32 18.1	4.409
14	4 54 12.91	2.2594	22 2 50.5	0.708	14	6 40 32.11	2.1522	20 27 50.6	4.506
15	4 56 28.45	2.2585	22 3 29.5	0.592	15	6 42 41.15	2.1490	20 23 17.3	4.603
16	4 58 43.93	2.2574	22 4 1.5	0.475	16	6 44 49.99	2.1457	20 18 38.2	4.699
17	5 0 59.34	2.2562	22 4 26.5	0.359	17	6 46 58.64	2.1425	20 13 53.4	4.793
18	5 3 14.67	2.2549	22 4 44.6	0.244	18	6 49 7.09	2.1392	20 9 3.0	4.887
19	5 5 29.93	2.2537	22 4 55.8	0.128	19	6 51 15.34	2.1358	20 4 6.9	4.981
20	5 7 45.12	2.2525	22 5 0.0	+ 0.012	20	6 53 23.39	2.1324	19 59 5.2	5.074
21	5 10 0.23	2.2511	22 4 57.2	− 0.104	21	6 55 31.23	2.1290	19 53 58.0	5.167
22	5 12 15.25	2.2497	22 4 47.5	0.218	22	6 57 38.87	2.1256	19 48 45.2	5.258
23	5 14 30.19	2.2482	N.22 4 31.0	0.332	23	6 59 46.30	2.1222	N.19 43 27.0	5.349
	MONDAY 2.					WEDNESDAY 4.			
0	5 16 45.04	2.2467	N.22 4 7.6	0.447	0	7 1 53.53	2.1187	N.19 38 3.3	5.440
1	5 18 59.79	2.2451	22 3 37.4	0.561	1	7 4 0.55	2.1152	19 32 34.2	5.529
2	5 21 14.45	2.2435	22 3 0.3	0.676	2	7 6 7.36	2.1117	19 26 59.8	5.617
3	5 23 29.01	2.2418	22 2 16.3	0.790	3	7 8 13.96	2.1083	19 21 20.1	5.706
4	5 25 43.46	2.2400	22 1 25.5	0.903	4	7 10 20.36	2.1048	19 15 35.1	5.794
5	5 27 57.81	2.2382	22 0 27.9	1.017	5	7 12 26.54	2.1012	19 9 44.8	5.882
6	5 30 12.05	2.2364	21 59 23.5	1.129	6	7 14 32.51	2.0977	19 3 49.3	5.968
7	5 32 26.18	2.2345	21 58 12.4	1.242	7	7 16 38.27	2.0942	18 57 48.7	6.053
8	5 34 40.19	2.2325	21 56 54.5	1.354	8	7 18 43.81	2.0906	18 51 43.0	6.137
9	5 36 54.08	2.2305	21 55 29.9	1.466	9	7 20 49.14	2.0870	18 45 32.3	6.221
10	5 39 7.85	2.2284	21 53 58.6	1.577	10	7 22 54.25	2.0834	18 39 16.5	6.304
11	5 41 21.49	2.2263	21 52 20.6	1.688	11	7 24 59.15	2.0799	18 32 55.8	6.386
12	5 43 35.00	2.2241	21 50 36.0	1.799	12	7 27 3.84	2.0763	18 26 30.2	6.467
13	5 45 48.38	2.2218	21 48 44.7	1.910	13	7 29 8.31	2.0727	18 19 59.7	6.548
14	5 48 1.62	2.2196	21 46 46.8	2.019	14	7 31 12.56	2.0691	18 13 24.4	6.629
15	5 50 14.73	2.2173	21 44 42.4	2.128	15	7 33 16.60	2.0656	18 6 44.2	6.709
16	5 52 27.70	2.2149	21 42 31.4	2.238	16	7 35 20.43	2.0620	17 59 59.3	6.787
17	5 54 40.52	2.2125	21 40 13.9	2.347	17	7 37 24.04	2.0583	17 53 9.7	6.865
18	5 56 53.20	2.2101	21 37 49.8	2.455	18	7 39 27.43	2.0547	17 46 15.5	6.943
19	5 59 5.73	2.2076	21 35 19.3	2.562	19	7 41 30.61	2.0512	17 39 16.6	7.020
20	6 1 18.11	2.2050	21 32 42.3	2.670	20	7 43 33.57	2.0475	17 32 13.1	7.095
21	6 3 30.33	2.2024	21 29 58.9	2.777	21	7 45 36.31	2.0439	17 25 5.2	7.169
22	6 5 42.40	2.1997	21 27 9.1	2.883	22	7 47 38.84	2.0404	17 17 52.8	7.243
23	6 7 54.30	2.1970	21 24 13.0	2.988	23	7 49 41.16	2.0368	17 10 36.0	7.317
24	6 10 6.04	2.1943	N.21 21 10.6	3.093	24	7 51 43.26	2.0332	N.17 3 14.7	7.391

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 51 43.26	2.0332	N.17 3 14.7	7.391
1	7 53 45.15	2.0297	16 55 49.1	7.462
2	7 55 46.82	2.0261	16 48 19.2	7.533
3	7 57 48.28	2.0226	16 40 45.1	7.603
4	7 59 49.53	2.0190	16 33 6.8	7.673
5	8 1 50.56	2.0154	16 25 24.3	7.742
6	8 3 51.38	2.0119	16 17 37.7	7.811
7	8 5 51.99	2.0084	16 9 47.0	7.878
8	8 7 52.39	2.0049	16 1 52.3	7.944
9	8 9 52.58	2.0014	15 53 53.7	8.010
10	8 11 52.56	1.9980	15 45 51.1	8.076
11	8 13 52.34	1.9946	15 37 44.6	8.140
12	8 15 51.91	1.9911	15 29 34.3	8.203
13	8 17 51.27	1.9877	15 21 20.2	8.266
14	8 19 50.43	1.9843	15 13 2.4	8.328
15	8 21 49.39	1.9810	15 4 40.9	8.389
16	8 23 48.15	1.9776	14 56 15.7	8.451
17	8 25 46.71	1.9742	14 47 46.8	8.512
18	8 27 45.06	1.9709	14 39 14.3	8.571
19	8 29 43.22	1.9677	14 30 38.3	8.629
20	8 31 41.18	1.9644	14 21 58.9	8.686
21	8 33 38.95	1.9612	14 13 16.0	8.743
22	8 35 36.53	1.9580	14 4 29.7	8.799
23	8 37 33.91	1.9548	N.13 55 40.1	8.854

FRIDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 39 31.10	1.9516	N.13 46 47.2	8.909
1	8 41 28.10	1.9485	13 37 51.0	8.963
2	8 43 24.92	1.9454	13 28 51.6	9.017
3	8 45 21.55	1.9423	13 19 49.0	9.069
4	8 47 18.00	1.9393	13 10 43.3	9.121
5	8 49 14.27	1.9362	13 1 34.5	9.172
6	8 51 10.35	1.9332	12 52 22.7	9.222
7	8 53 6.25	1.9303	12 43 7.9	9.272
8	8 55 1.98	1.9274	12 33 50.1	9.321
9	8 56 57.54	1.9246	12 24 29.4	9.369
10	8 58 52.93	1.9217	12 15 5.8	9.417
11	9 0 48.15	1.9189	12 5 39.4	9.463
12	9 2 43.20	1.9161	11 56 10.2	9.509
13	9 4 38.08	1.9133	11 46 38.3	9.554
14	9 6 32.80	1.9106	11 37 3.7	9.599
15	9 8 27.35	1.9078	11 27 26.4	9.643
16	9 10 21.74	1.9052	11 17 46.5	9.687
17	9 12 15.98	1.9027	11 8 4.0	9.729
18	9 14 10.06	1.9001	10 58 19.0	9.771
19	9 16 3.99	1.8976	10 48 31.5	9.812
20	9 17 57.77	1.8951	10 38 41.6	9.852
21	9 19 51.40	1.8926	10 28 49.2	9.892
22	9 21 44.88	1.8902	10 18 54.5	9.932
23	9 23 38.22	1.8878	10 8 57.4	9.971
24	9 25 31.42	1.8855	N. 9 58 58.0	10.008

SATURDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	9 25 31.42	1.8855	N. 9 58 58.0	10.008
1	9 27 24.48	1.8832	9 48 56.4	10.045
2	9 29 17.40	1.8809	9 38 52.6	10.082
3	9 31 10.19	1.8787	9 28 46.6	10.118
4	9 33 2.85	1.8766	9 18 38.5	10.153
5	9 34 55.38	1.8744	9 8 28.3	10.187
6	9 36 47.78	1.8723	8 58 16.1	10.220
7	9 38 40.06	1.8703	8 48 1.9	10.253
8	9 40 32.21	1.8683	8 37 45.7	10.286
9	9 42 24.25	1.8664	8 27 27.6	10.317
10	9 44 16.18	1.8645	8 17 7.6	10.348
11	9 46 7.99	1.8626	8 6 45.8	10.379
12	9 47 59.69	1.8608	7 56 22.1	10.409
13	9 49 51.28	1.8590	7 45 56.7	10.438
14	9 51 42.77	1.8573	7 35 29.6	10.466
15	9 53 34.16	1.8557	7 25 0.8	10.494
16	9 55 25.45	1.8540	7 14 30.3	10.522
17	9 57 16.64	1.8524	7 3 58.1	10.550
18	9 59 7.74	1.8509	6 53 24.3	10.576
19	10 0 58.75	1.8494	6 42 49.0	10.601
20	10 2 49.67	1.8479	6 32 12.2	10.625
21	10 4 40.50	1.8465	6 21 34.0	10.649
22	10 6 31.25	1.8452	6 10 54.3	10.672
23	10 8 21.93	1.8440	N. 6 0 13.3	10.695

SUNDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	10 10 12.53	1.8427	N. 5 49 30.9	10.717
1	10 12 3.05	1.8415	5 38 47.2	10.739
2	10 13 53.51	1.8404	5 28 2.2	10.761
3	10 15 43.90	1.8393	5 17 15.9	10.782
4	10 17 34.23	1.8383	5 6 28.4	10.801
5	10 19 24.50	1.8373	4 55 39.8	10.820
6	10 21 14.71	1.8364	4 44 50.0	10.839
7	10 23 4.87	1.8356	4 33 59.1	10.857
8	10 24 54.98	1.8347	4 23 7.2	10.873
9	10 26 45.03	1.8339	4 12 14.3	10.891
10	10 28 35.04	1.8332	4 1 20.3	10.907
11	10 30 25.01	1.8326	3 50 25.4	10.922
12	10 32 14.95	1.8320	3 39 29.6	10.937
13	10 34 4.85	1.8314	3 28 32.9	10.952
14	10 35 54.72	1.8308	3 17 35.4	10.966
15	10 37 44.55	1.8303	3 6 37.0	10.979
16	10 39 34.36	1.8300	2 55 37.9	10.991
17	10 41 24.15	1.8297	2 44 38.1	11.003
18	10 43 13.92	1.8294	2 33 37.5	11.015
19	10 45 3.67	1.8291	2 22 36.3	11.026
20	10 46 53.41	1.8289	2 11 34.4	11.037
21	10 48 43.14	1.8288	2 0 31.9	11.046
22	10 50 32.87	1.8287	1 49 28.9	11.054
23	10 52 22.59	1.8287	1 38 25.4	11.063
24	10 54 12.31	1.8287	N. 1 27 21.3	11.071

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 9.					**WEDNESDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 54 12.31	1.8287	N. 1 27 21.3	11.071	0	12 23 8.02	1.8994	S. 7 21 46.9	10.739
1	10 56 2.04	1.8288	1 16 16.8	11.078	1	12 25 2.07	1.9023	7 32 30.6	10.716
2	10 57 51.77	1.8289	1 5 11.9	11.085	2	12 26 56.30	1.9054	7 43 12.9	10.692
3	10 59 41.51	1.8292	0 54 6.6	11.092	3	12 28 50.72	1.9085	7 53 53.7	10.668
4	11 1 31.27	1.8295	0 43 0.9	11.097	4	12 30 45.32	1.9116	8 4 33.1	10.644
5	11 3 21.05	1.8298	0 31 54.9	11.102	5	12 32 40.11	1.9148	8 15 11.0	10.618
6	11 5 10.85	1.8302	0 20 48.7	11.106	6	12 34 35.10	1.9181	8 25 47.3	10.592
7	11 7 0.68	1.8306	N. 0 9 42.2	11.110	7	12 36 30.29	1.9214	8 36 22.1	10.566
8	11 8 50.53	1.8311	S. 0 1 24.5	11.113	8	12 38 25.67	1.9247	8 46 55.2	10.538
9	11 10 40.41	1.8317	0 12 31.3	11.115	9	12 40 21.25	1.9281	8 57 26.6	10.509
10	11 12 30.33	1.8323	0 23 38.3	11.117	10	12 42 17.04	1.9317	9 7 56.3	10.480
11	11 14 20.29	1.8329	0 34 45.4	11.119	11	12 44 13.05	1.9352	9 18 24.2	10.450
12	11 16 10.28	1.8336	0 45 52.6	11.120	12	12 46 9.27	1.9388	9 28 50.3	10.419
13	11 18 0.32	1.8344	0 56 59.8	11.120	13	12 48 5.71	1.9425	9 39 14.5	10.388
14	11 19 50.41	1.8353	1 8 7.0	11.120	14	12 50 2.37	1.9462	9 49 36.9	10.356
15	11 21 40.56	1.8362	1 19 14.2	11.119	15	12 51 59.25	1.9499	9 59 57.3	10.323
16	11 23 30.76	1.8372	1 30 21.3	11.117	16	12 53 56.36	1.9538	10 10 15.7	10.289
17	11 25 21.02	1.8382	1 41 28.2	11.114	17	12 55 53.71	1.9577	10 20 32.0	10.255
18	11 27 11.34	1.8393	1 52 35.0	11.111	18	12 57 51.29	1.9617	10 30 46.3	10.220
19	11 29 1.73	1.8404	2 3 41.6	11.108	19	12 59 49.11	1.9657	10 40 58.4	10.184
20	11 30 52.19	1.8416	2 14 48.0	11.105	20	13 1 47.18	1.9698	10 51 8.3	10.147
21	11 32 42.72	1.8428	2 25 54.2	11.100	21	13 3 45.49	1.9739	11 1 16.0	10.109
22	11 34 33.33	1.8442	2 37 0.0	11.094	22	13 5 44.05	1.9781	11 11 21.4	10.071
23	11 36 24.02	1.8455	S. 2 48 5.5	11.089	23	13 7 42.86	1.9824	S. 11 21 24.5	10.032
	TUESDAY 10.					**THURSDAY 12.**			
0	11 38 14.79	1.8469	S. 2 59 10.7	11.083	0	13 9 41.93	1.9867	S. 11 31 25.2	9.992
1	11 40 5.65	1.8484	3 10 15.5	11.076	1	13 11 41.26	1.9910	11 41 23.5	9.950
2	11 41 56.60	1.8500	3 21 19.8	11.068	2	13 13 40.85	1.9954	11 51 19.2	9.908
3	11 43 47.65	1.8517	3 32 23.6	11.059	3	13 15 40.71	1.9999	12 1 12.4	9.865
4	11 45 38.80	1.8533	3 43 26.9	11.051	4	13 17 40.84	2.0044	12 11 3.0	9.821
5	11 47 30.05	1.8550	3 54 29.7	11.042	5	13 19 41.24	2.0090	12 20 50.9	9.777
6	11 49 21.40	1.8568	4 5 31.9	11.032	6	13 21 41.92	2.0137	12 30 36.2	9.732
7	11 51 12.87	1.8587	4 16 33.5	11.021	7	13 23 42.88	2.0183	12 40 18.7	9.685
8	11 53 4.45	1.8606	4 27 34.4	11.009	8	13 25 44.12	2.0231	12 49 58.4	9.637
9	11 54 56.14	1.8625	4 38 34.6	10.997	9	13 27 45.65	2.0279	12 59 35.2	9.589
10	11 56 47.95	1.8646	4 49 34.1	10.985	10	13 29 47.47	2.0327	13 9 9.1	9.540
11	11 58 39.89	1.8667	5 0 32.8	10.971	11	13 31 49.58	2.0376	13 18 40.0	9.491
12	12 0 31.96	1.8689	5 11 30.6	10.957	12	13 33 51.98	2.0425	13 28 8.0	9.441
13	12 2 24.16	1.8711	5 22 27.6	10.942	13	13 35 54.68	2.0475	13 37 32.9	9.388
14	12 4 16.49	1.8733	5 33 23.7	10.927	14	13 37 57.68	2.0526	13 46 54.6	9.335
15	12 6 8.96	1.8757	5 44 18.9	10.912	15	13 40 0.99	2.0577	13 56 13.1	9.282
16	12 8 1.57	1.8781	5 55 13.1	10.895	16	13 42 4.60	2.0629	14 5 28.4	9.227
17	12 9 54.33	1.8806	6 6 6.3	10.877	17	13 44 8.53	2.0681	14 14 40.4	9.172
18	12 11 47.24	1.8831	6 16 58.4	10.859	18	13 46 12.77	2.0733	14 23 49.0	9.115
19	12 13 40.30	1.8857	6 27 49.4	10.841	19	13 48 17.33	2.0786	14 32 54.2	9.057
20	12 15 33.52	1.8883	6 38 39.3	10.822	20	13 50 22.20	2.0839	14 41 55.9	8.999
21	12 17 26.89	1.8909	6 49 28.1	10.802	21	13 52 27.39	2.0893	14 50 54.1	8.940
22	12 19 20.43	1.8937	7 0 15.6	10.782	22	13 54 32.91	2.0947	14 59 48.7	8.879
23	12 21 14.14	1.8966	7 11 1.9	10.761	23	13 56 38.75	2.1001	15 8 39.6	8.818
24	12 23 8.02	1.8994	S. 7 21 46.9	10.739	24	13 58 44.92	2.1056	S. 15 17 26.9	8.757

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 58 44.92	2.1056	S.15 17 26.9	8.757
1	14 0 51.42	2.1112	15 26 10.4	8.693
2	14 2 58.26	2.1167	15 34 50.0	8.628
3	14 5 5.43	2.1223	15 43 25.7	8.563
4	14 7 12.94	2.1280	15 51 57.5	8.496
5	14 9 20.79	2.1337	16 0 25.2	8.428
6	14 11 28.99	2.1395	16 8 48.8	8.359
7	14 13 37.53	2.1452	16 17 8.3	8.290
8	14 15 46.42	2.1510	16 25 23.6	8.218
9	14 17 55.65	2.1568	16 33 34.5	8.146
10	14 20 5.23	2.1627	16 41 41.1	8.073
11	14 22 15.17	2.1686	16 49 43.3	7.999
12	14 24 25.46	2.1745	16 57 41.0	7.923
13	14 26 36.11	2.1805	17 5 34.1	7.847
14	14 28 47.12	2.1864	17 13 22.7	7.771
15	14 30 58.48	2.1923	17 21 6.6	7.692
16	14 33 10.20	2.1984	17 28 45.7	7.612
17	14 35 22.29	2.2046	17 36 20.0	7.532
18	14 37 34.75	2.2107	17 43 49.5	7.450
19	14 39 47.57	2.2167	17 51 14.0	7.367
20	14 42 0.75	2.2228	17 58 33.5	7.283
21	14 44 14.30	2.2289	18 5 47.9	7.197
22	14 46 28.22	2.2351	18 12 57.1	7.110
23	14 48 42.51	2.2412	S.18 20 1.1	7.022

SATURDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 50 57.17	2.2474	S.18 26 59.8	6.934
1	14 53 12.20	2.2536	18 33 53.2	6.844
2	14 55 27.60	2.2597	18 40 41.1	6.752
3	14 57 43.37	2.2659	18 47 23.5	6.660
4	14 59 59.51	2.2721	18 54 0.3	6.567
5	15 2 16.02	2.2783	19 0 31.5	6.473
6	15 4 32.91	2.2846	19 6 57.0	6.377
7	15 6 50.17	2.2908	19 13 16.7	6.279
8	15 9 7.80	2.2969	19 19 30.5	6.181
9	15 11 25.80	2.3031	19 25 38.4	6.082
10	15 13 44.17	2.3093	19 31 40.3	5.981
11	15 16 2.91	2.3155	19 37 36.1	5.879
12	15 18 22.03	2.3217	19 43 25.8	5.777
13	15 20 41.52	2.3278	19 49 9.3	5.673
14	15 23 1.37	2.3339	19 54 46.5	5.567
15	15 25 21.59	2.3401	20 0 17.3	5.460
16	15 27 42.18	2.3462	20 5 41.7	5.353
17	15 30 3.14	2.3523	20 10 59.7	5.245
18	15 32 24.46	2.3583	20 16 11.1	5.134
19	15 34 46.14	2.3644	20 21 15.8	5.023
20	15 37 8.19	2.3705	20 26 13.8	4.911
21	15 39 30.60	2.3764	20 31 5.1	4.798
22	15 41 53.36	2.3823	20 35 49.5	4.683
23	15 44 16.48	2.3883	20 40 27.0	4.568
24	15 46 39.96	2.3942	S.20 44 57.6	4.451

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 46 39.96	2.3942	S.20 44 57.6	4.451
1	15 49 3.79	2.4001	20 49 21.1	4.332
2	15 51 27.97	2.4059	20 53 37.5	4.212
3	15 53 52.50	2.4116	20 57 46.6	4.092
4	15 56 17.37	2.4173	21 1 48.5	3.971
5	15 58 42.58	2.4230	21 5 43.1	3.848
6	16 1 8.13	2.4287	21 9 30.3	3.724
7	16 3 34.02	2.4343	21 13 10.0	3.599
8	16 6 0.25	2.4399	21 16 42.2	3.474
9	16 8 26.81	2.4453	21 20 6.9	3.347
10	16 10 53.69	2.4507	21 23 23.9	3.219
11	16 13 20.89	2.4561	21 26 33.2	3.090
12	16 15 48.42	2.4615	21 29 34.7	2.960
13	16 18 16.27	2.4667	21 32 28.4	2.829
14	16 20 44.42	2.4718	21 35 14.2	2.697
15	16 23 12.88	2.4769	21 37 52.0	2.563
16	16 25 41.65	2.4820	21 40 21.8	2.429
17	16 28 10.72	2.4869	21 42 43.5	2.294
18	16 30 40.08	2.4918	21 44 57.1	2.158
19	16 33 9.74	2.4966	21 47 2.5	2.021
20	16 35 39.68	2.5013	21 48 59.7	1.883
21	16 38 9.90	2.5060	21 50 48.5	1.744
22	16 40 40.40	2.5106	21 52 29.0	1.605
23	16 43 11.17	2.5151	S.21 54 1.1	1.464

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 45 42.21	2.5195	S.21 55 24.8	1.324
1	16 48 13.51	2.5238	21 56 40.0	1.182
2	16 50 45.07	2.5281	21 57 46.6	1.038
3	16 53 16.88	2.5322	21 58 44.6	0.895
4	16 55 48.93	2.5362	21 59 34.0	0.751
5	16 58 21.22	2.5402	22 0 14.7	0.605
6	17 0 53.75	2.5441	22 0 46.6	0.458
7	17 3 26.51	2.5478	22 1 9.7	0.312
8	17 5 59.49	2.5514	22 1 24.0	0.165
9	17 8 32.68	2.5549	22 1 29.5	− 0.017
10	17 11 6.08	2.5583	22 1 26.1	+ 0.131
11	17 13 39.69	2.5617	22 1 13.8	0.280
12	17 16 13.49	2.5649	22 0 52.5	0.430
13	17 18 47.48	2.5681	22 0 22.2	0.580
14	17 21 21.66	2.5712	21 59 42.9	0.730
15	17 23 56.02	2.5741	21 58 54.6	0.881
16	17 26 30.55	2.5768	21 57 57.2	1.033
17	17 29 5.24	2.5795	21 56 50.7	1.185
18	17 31 40.09	2.5821	21 55 35.0	1.337
19	17 34 15.09	2.5845	21 54 10.2	1.490
20	17 36 50.23	2.5869	21 52 36.2	1.643
21	17 39 25.52	2.5892	21 50 53.0	1.797
22	17 42 0.94	2.5913	21 49 0.6	1.950
23	17 44 36.48	2.5932	21 46 59.0	2.104
24	17 47 12.13	2.5951	S.21 44 48.1	2.258

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 17.					**THURSDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 47 12.13	2.5951	S. 21 44 48.1	2.258	0	19 51 45.97	2.5555	S. 17 3 16.1	9.226
1	17 49 47.89	2.5969	21 42 28.0	2.412	1	19 54 19.21	2.5524	16 53 58.8	9.349
2	17 52 23.76	2.5986	21 39 58.6	2.567	2	19 56 52.26	2.5493	16 44 34.2	9.471
3	17 54 59.72	2.6001	21 37 20.0	2.721	3	19 59 25.13	2.5462	16 35 2.3	9.592
4	17 57 35.77	2.6015	21 34 32.1	2.876	4	20 1 57.81	2.5430	16 25 23.2	9.710
5	18 0 11.90	2.6027	21 31 34.9	3.031	5	20 4 30.29	2.5397	16 15 37.1	9.827
6	18 2 48.10	2.6039	21 28 28.4	3.185	6	20 7 2.57	2.5363	16 5 44.0	9.943
7	18 5 24.37	2.6050	21 25 12.7	3.339	7	20 9 34.65	2.5330	15 55 43.9	10.058
8	18 8 0.70	2.6060	21 21 47.7	3.494	8	20 12 6.53	2.5297	15 45 37.0	10.171
9	18 10 37.09	2.6068	21 18 13.4	3.648	9	20 14 38.21	2.5263	15 35 23.4	10.282
10	18 13 13.52	2.6074	21 14 29.9	3.802	10	20 17 9.68	2.5227	15 25 3.1	10.392
11	18 15 49.98	2.6080	21 10 37.1	3.957	11	20 19 40.93	2.5190	15 14 36.3	10.501
12	18 18 26.48	2.6085	21 6 35.1	4.111	12	20 22 11.96	2.5154	15 4 3.0	10.608
13	18 21 3.00	2.6088	21 2 23.8	4.264	13	20 24 42.78	2.5118	14 53 23.4	10.713
14	18 23 39.54	2.6091	20 58 3.4	4.417	14	20 27 13.38	2.5082	14 42 37.5	10.817
15	18 26 16.09	2.6092	20 53 33.8	4.570	15	20 29 43.77	2.5046	14 31 45.4	10.919
16	18 28 52.64	2.6092	20 48 55.0	4.722	16	20 32 13.94	2.5009	14 20 47.2	11.019
17	18 31 29.19	2.6091	20 44 7.1	4.875	17	20 34 43.88	2.4972	14 9 43.1	11.118
18	18 34 5.73	2.6088	20 39 10.0	5.027	18	20 37 13.60	2.4934	13 58 33.1	11.215
19	18 36 42.25	2.6084	20 34 3.8	5.178	19	20 39 43.09	2.4897	13 47 17.3	11.311
20	18 39 18.74	2.6079	20 28 48.6	5.329	20	20 42 12.36	2.4859	13 35 55.8	11.404
21	18 41 55.20	2.6073	20 23 24.3	5.480	21	20 44 41.40	2.4820	13 24 28.8	11.496
22	18 44 31.63	2.6068	20 17 51.0	5.629	22	20 47 10.20	2.4782	13 12 56.3	11.587
23	18 47 8.02	2.6061	S. 20 12 8.8	5.778	23	20 49 38.78	2.4744	S. 13 1 18.4	11.675
	WEDNESDAY 18.					**FRIDAY 20.**			
0	18 49 44.36	2.6052	S. 20 6 17.6	5.927	0	20 52 7.13	2.4706	S. 12 49 35.3	11.762
1	18 52 20.64	2.6041	20 0 17.5	6.075	1	20 54 35.25	2.4667	12 37 47.0	11.847
2	18 54 56.85	2.6029	19 54 8.6	6.223	2	20 57 3.13	2.4628	12 25 53.6	11.931
3	18 57 32.99	2.6017	19 47 50.8	6.370	3	20 59 30.78	2.4589	12 13 55.3	12.012
4	19 0 9.06	2.6005	19 41 24.2	6.515	4	21 1 58.20	2.4550	12 1 52.2	12.092
5	19 2 45.05	2.5991	19 34 49.0	6.659	5	21 4 25.38	2.4511	11 49 44.3	12.170
6	19 5 20.95	2.5976	19 28 5.1	6.804	6	21 6 52.33	2.4472	11 37 31.8	12.246
7	19 7 56.76	2.5960	19 21 12.5	6.947	7	21 9 19.05	2.4433	11 25 14.8	12.321
8	19 10 32.47	2.5942	19 14 11.4	7.089	8	21 11 45.53	2.4394	11 12 53.3	12.394
9	19 13 8.07	2.5924	19 7 1.8	7.231	9	21 14 11.78	2.4356	11 0 27.5	12.465
10	19 15 43.56	2.5905	18 59 43.7	7.372	10	21 16 37.80	2.4317	10 47 57.5	12.534
11	19 18 18.93	2.5886	18 52 17.1	7.512	11	21 19 3.58	2.4278	10 35 23.4	12.602
12	19 20 54.19	2.5866	18 44 42.2	7.651	12	21 21 29.13	2.4239	10 22 45.3	12.667
13	19 23 29.32	2.5844	18 36 59.0	7.788	13	21 23 54.45	2.4201	10 10 3.3	12.731
14	19 26 4.31	2.5821	18 29 7.6	7.925	14	21 26 19.54	2.4162	9 57 17.6	12.792
15	19 28 39.17	2.5798	18 21 8.0	8.061	15	21 28 44.40	2.4124	9 44 28.2	12.852
16	19 31 13.89	2.5774	18 13 0.3	8.195	16	21 31 9.03	2.4087	9 31 35.3	12.911
17	19 33 48.46	2.5749	18 4 44.6	8.327	17	21 33 33.44	2.4049	9 18 38.9	12.968
18	19 36 22.88	2.5723	17 56 21.0	8.459	18	21 35 57.62	2.4011	9 5 39.1	13.023
19	19 38 57.14	2.5697	17 47 49.5	8.591	19	21 38 21.57	2.3973	8 52 36.1	13.076
20	19 41 31.24	2.5670	17 39 10.1	8.721	20	21 40 45.30	2.3936	8 39 30.0	13.127
21	19 44 5.18	2.5642	17 30 23.0	8.849	21	21 43 8.80	2.3899	8 26 20.9	13.176
22	19 46 38.95	2.5614	17 21 28.2	8.976	22	21 45 32.08	2.3862	8 13 8.9	13.224
23	19 49 12.55	2.5585	17 12 25.9	9.101	23	21 47 55.14	2.3826	7 59 54.0	13.271
24	19 51 45.97	2.5555	S. 17 3 16.1	9.226	24	21 50 17.99	2.3790	S. 7 46 36.4	13.314

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 50 17.99	2.3790	S. 7 46 36.4	13.314
1	21 52 40.62	2.3753	7 33 16.3	13.356
2	21 55 3.03	2.3717	7 19 53.7	13.397
3	21 57 25.23	2.3682	7 6 28.7	13.436
4	21 59 47.21	2.3647	6 53 1.4	13.473
5	22 2 8.99	2.3612	6 39 32.0	13.508
6	22 4 30.56	2.3577	6 26 0.5	13.541
7	22 6 51.92	2.3543	6 12 27.1	13.572
8	22 9 13.08	2.3510	5 58 51.8	13.602
9	22 11 34.04	2.3477	5 45 14.8	13.630
10	22 13 54.80	2.3444	5 31 36.2	13.657
11	22 16 15.36	2.3411	5 17 56.0	13.682
12	22 18 35.73	2.3378	5 4 14.4	13.704
13	22 20 55.90	2.3347	4 50 31.5	13.725
14	22 23 15.89	2.3316	4 36 47.4	13.745
15	22 25 35.69	2.3284	4 23 2.1	13.763
16	22 27 55.30	2.3253	4 9 15.8	13.779
17	22 30 14.73	2.3223	3 55 28.6	13.793
18	22 32 33.98	2.3193	3 41 40.7	13.805
19	22 34 53.05	2.3164	3 27 52.0	13.817
20	22 37 11.95	2.3136	3 14 2.6	13.827
21	22 39 30.68	2.3107	3 0 12.8	13.834
22	22 41 49.24	2.3079	2 46 22.6	13.840
23	22 44 7.63	2.3051	S. 2 32 32.0	13.845

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 46 25.85	2.3023	S. 2 18 41.2	13.847
1	22 48 43.91	2.2997	2 4 50.3	13.848
2	22 51 1.82	2.2972	1 50 59.4	13.848
3	22 53 19.58	2.2947	1 37 8.5	13.847
4	22 55 37.18	2.2921	1 23 17.8	13.843
5	22 57 54.63	2.2896	1 9 27.4	13.838
6	23 0 11.93	2.2872	0 55 37.3	13.831
7	23 2 29.09	2.2848	0 41 47.7	13.822
8	23 4 46.11	2.2825	0 27 58.6	13.813
9	23 7 2.99	2.2802	0 14 10.1	13.802
10	23 9 19.74	2.2780	S. 0 0 22.3	13.789
11	23 11 36.35	2.2758	N. 0 13 24.6	13.774
12	23 13 52.83	2.2737	0 27 10.6	13.758
13	23 16 9.19	2.2717	0 40 55.6	13.741
14	23 18 25.43	2.2696	0 54 39.5	13.722
15	23 20 41.54	2.2676	1 8 22.3	13.702
16	23 22 57.54	2.2657	1 22 3.8	13.681
17	23 25 13.43	2.2638	1 35 44.0	13.658
18	23 27 29.20	2.2619	1 49 22.8	13.633
19	23 29 44.86	2.2602	2 3 0.0	13.607
20	23 32 0.42	2.2585	2 16 35.6	13.580
21	23 34 15.88	2.2568	2 30 9.6	13.552
22	23 36 31.24	2.2552	2 43 41.8	13.521
23	23 38 46.50	2.2536	2 57 12.1	13.489
24	23 41 1.67	2.2521	N. 3 10 40.5	13.457

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 41 1.67	2.2521	N. 3 10 40.5	13.457
1	23 43 16.75	2.2506	3 24 6.9	13.423
2	23 45 31.74	2.2492	3 37 31.2	13.388
3	23 47 46.65	2.2478	3 50 53.4	13.351
4	23 50 1.48	2.2465	4 4 13.3	13.312
5	23 52 16.23	2.2452	4 17 30.8	13.272
6	23 54 30.90	2.2439	4 30 46.0	13.232
7	23 56 45.50	2.2428	4 43 58.7	13.190
8	23 59 0.03	2.2417	4 57 8.8	13.147
9	0 1 14.50	2.2406	5 10 16.3	13.102
10	0 3 28.90	2.2395	5 23 21.1	13.057
11	0 5 43.24	2.2385	5 36 23.2	13.011
12	0 7 57.52	2.2376	5 49 22.4	12.963
13	0 10 11.75	2.2367	6 2 18.7	12.913
14	0 12 25.92	2.2358	6 15 12.0	12.862
15	0 14 40.04	2.2350	6 28 2.2	12.811
16	0 16 54.12	2.2342	6 40 49.3	12.758
17	0 19 8.15	2.2335	6 53 33.2	12.704
18	0 21 22.14	2.2328	7 6 13.8	12.649
19	0 23 36.09	2.2322	7 18 51.1	12.593
20	0 25 50.00	2.2316	7 31 25.0	12.536
21	0 28 3.88	2.2310	7 43 55.4	12.477
22	0 30 17.72	2.2305	7 56 22.3	12.418
23	0 32 31.54	2.2301	N. 8 8 45.6	12.358

TUESDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 34 45.33	2.2297	N. 8 21 5.3	12.296
1	0 36 59.10	2.2292	8 33 21.2	12.233
2	0 39 12.84	2.2288	8 45 33.3	12.170
3	0 41 26.56	2.2286	8 57 41.6	12.106
4	0 43 40.27	2.2283	9 9 46.0	12.040
5	0 45 53.96	2.2281	9 21 46.4	11.973
6	0 48 7.64	2.2279	9 33 42.7	11.905
7	0 50 21.31	2.2278	9 45 35.0	11.837
8	0 52 34.97	2.2277	9 57 23.1	11.767
9	0 54 48.63	2.2276	10 9 7.0	11.696
10	0 57 2.28	2.2275	10 20 46.6	11.624
11	0 59 15.93	2.2274	10 32 21.9	11.552
12	1 1 29.57	2.2274	10 43 52.9	11.479
13	1 3 43.22	2.2275	10 55 19.4	11.404
14	1 5 56.87	2.2275	11 6 41.4	11.329
15	1 8 10.53	2.2277	11 17 58.9	11.253
16	1 10 24.20	2.2279	11 29 11.8	11.176
17	1 12 37.88	2.2280	11 40 20.0	11.098
18	1 14 51.56	2.2282	11 51 23.5	11.019
19	1 17 5.26	2.2284	12 2 22.3	10.940
20	1 19 18.97	2.2287	12 13 16.3	10.859
21	1 21 32.70	2.2290	12 24 5.4	10.777
22	1 23 46.45	2.2292	12 34 49.5	10.694
23	1 26 0.21	2.2295	12 45 28.7	10.611
24	1 28 13.99	2.2299	N. 12 56 2.9	10.528

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 28 13.99	2.2299	N.12 56 2.9	10.528
1	1 30 27.80	2.2303	13 6 32.1	10.444
2	1 32 41.63	2.2307	13 16 56.2	10.358
3	1 34 55.48	2.2311	13 27 15.1	10.272
4	1 37 9.36	2.2315	13 37 28.8	10.185
5	1 39 23.26	2.2319	13 47 37.3	10.097
6	1 41 37.19	2.2324	13 57 40.5	10.008
7	1 43 51.15	2.2329	14 7 38.3	9.919
8	1 46 5.14	2.2334	14 17 30.8	9.830
9	1 48 19.16	2.2339	14 27 17.9	9.740
10	1 50 33.21	2.2345	14 36 59.6	9.648
11	1 52 47.30	2.2351	14 46 35.7	9.556
12	1 55 1.42	2.2356	14 56 6.3	9.463
13	1 57 15.57	2.2362	15 5 31.3	9.370
14	1 59 29.76	2.2367	15 14 50.7	9.277
15	2 1 43.98	2.2373	15 24 4.5	9.182
16	2 3 58.24	2.2379	15 33 12.5	9.086
17	2 6 12.53	2.2385	15 42 14.8	8.990
18	2 8 26.86	2.2392	15 51 11.3	8.893
19	2 10 41.23	2.2397	16 0 2.0	8.796
20	2 12 55.63	2.2403	16 8 46.8	8.698
21	2 15 10.07	2.2410	16 17 25.8	8.601
22	2 17 24.55	2.2416	16 25 58.9	8.502
23	2 19 39.06	2.2422	N.16 34 26.0	8.402

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	2 21 53.61	2.2428	N.16 42 47.1	8.302
1	2 24 8.20	2.2435	16 51 2.2	8.201
2	2 26 22.83	2.2441	16 59 11.2	8.100
3	2 28 37.50	2.2447	17 7 14.2	7.998
4	2 30 52.20	2.2453	17 15 11.0	7.896
5	2 33 6.94	2.2460	17 23 1.7	7.793
6	2 35 21.72	2.2466	17 30 46.2	7.690
7	2 37 36.53	2.2472	17 38 24.5	7.586
8	2 39 51.38	2.2478	17 45 56.5	7.482
9	2 42 6.27	2.2484	17 53 22.3	7.377
10	2 44 21.19	2.2490	18 0 41.8	7.272
11	2 46 36.15	2.2496	18 7 54.9	7.166
12	2 48 51.14	2.2501	18 15 1.7	7.060
13	2 51 6.16	2.2507	18 22 2.1	6.953
14	2 53 21.22	2.2512	18 28 56.1	6.847
15	2 55 36.31	2.2517	18 35 43.7	6.739
16	2 57 51.43	2.2522	18 42 24.8	6.632
17	3 0 6.58	2.2527	18 48 59.5	6.524
18	3 2 21.76	2.2532	18 55 27.7	6.415
19	3 4 36.97	2.2537	19 1 49.3	6.306
20	3 6 52.20	2.2541	19 8 4.4	6.197
21	3 9 7.46	2.2545	19 14 12.9	6.087
22	3 11 22.74	2.2549	19 20 14.8	5.977
23	3 13 38.04	2.2553	19 26 10.1	5.867
24	3 15 53.37	2.2557	N.19 31 58.8	5.756

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	3 15 53.37	2.2557	N.19 31 58.8	5.756
1	3 18 8.72	2.2560	19 37 40.8	5.645
2	3 20 24.09	2.2562	19 43 16.2	5.534
3	3 22 39.47	2.2565	19 48 44.9	5.423
4	3 24 54.87	2.2568	19 54 6.9	5.311
5	3 27 10.29	2.2571	19 59 22.2	5.198
6	3 29 25.72	2.2573	20 4 30.7	5.086
7	3 31 41.16	2.2574	20 9 32.5	4.973
8	3 33 56.61	2.2576	20 14 27.5	4.861
9	3 36 12.07	2.2577	20 19 15.8	4.748
10	3 38 27.53	2.2577	20 23 57.3	4.635
11	3 40 43.00	2.2578	20 28 32.0	4.521
12	3 42 58.47	2.2578	20 32 59.8	4.407
13	3 45 13.94	2.2578	20 37 20.8	4.293
14	3 47 29.41	2.2578	20 41 35.0	4.180
15	3 49 44.88	2.2577	20 45 42.4	4.066
16	3 52 0.34	2.2576	20 49 42.9	3.951
17	3 54 15.79	2.2575	20 53 36.5	3.837
18	3 56 31.24	2.2573	20 57 23.3	3.722
19	3 58 46.67	2.2571	21 1 3.2	3.607
20	4 1 2.09	2.2568	21 4 36.2	3.492
21	4 3 17.49	2.2565	21 8 2.3	3.377
22	4 5 32.87	2.2562	21 11 21.5	3.262
23	4 7 48.23	2.2558	N.21 14 33.8	3.147

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	4 10 3.57	2.2554	N.21 17 39.2	3.032
1	4 12 18.86	2.2549	21 20 37.7	2.917
2	4 14 34.16	2.2545	21 23 29.3	2.802
3	4 16 49.42	2.2540	21 26 14.0	2.687
4	4 19 4.64	2.2534	21 28 51.8	2.572
5	4 21 19.83	2.2528	21 31 22.7	2.457
6	4 23 34.98	2.2522	21 33 46.6	2.341
7	4 25 50.09	2.2515	21 36 3.6	2.226
8	4 28 5.16	2.2507	21 38 13.8	2.111
9	4 30 20.18	2.2500	21 40 17.0	1.996
10	4 32 35.16	2.2492	21 42 13.3	1.881
11	4 34 50.08	2.2483	21 44 2.7	1.766
12	4 37 4.95	2.2474	21 45 45.2	1.651
13	4 39 19.77	2.2465	21 47 20.8	1.536
14	4 41 34.53	2.2455	21 48 49.5	1.422
15	4 43 49.23	2.2445	21 50 11.4	1.307
16	4 46 3.87	2.2434	21 51 26.4	1.192
17	4 48 18.44	2.2422	21 52 34.5	1.077
18	4 50 32.94	2.2411	21 53 35.7	0.963
19	4 52 47.37	2.2399	21 54 30.1	0.850
20	4 55 1.73	2.2386	21 55 17.7	0.736
21	4 57 16.01	2.2373	21 55 58.4	0.622
22	4 59 30.21	2.2360	21 56 32.3	0.508
23	5 1 44.33	2.2347	21 56 59.4	0.394
24	5 3 58.37	2.2333	N.21 57 19.6	0.280

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 3 58.37	2.2333	N.21 57 19.6	0.280
1	5 6 12.32	2.2318	21 57 33.0	0.168
2	5 8 26.18	2.2303	21 57 39.7	+ 0.056
3	5 10 39.95	2.2288	21 57 39.7	− 0.057
4	5 12 53.63	2.2272	21 57 32.9	0.169
5	5 15 7.21	2.2255	21 57 19.4	0.281
6	5 17 20.69	2.2238	21 56 59.2	0.392
7	5 19 34.07	2.2221	21 56 32.3	0.504
8	5 21 47.34	2.2203	21 55 58.7	0.616
9	5 24 0.51	2.2186	21 55 18.4	0.727
10	5 26 13.57	2.2167	21 54 31.5	0.837
11	5 28 26.51	2.2147	21 53 37.9	0.948
12	5 30 39.33	2.2128	21 52 37.7	1.058
13	5 32 52.04	2.2108	21 51 30.9	1.167
14	5 35 4.63	2.2088	21 50 17.6	1.277
15	5 37 17.10	2.2068	21 48 57.7	1.386
16	5 39 29.45	2.2047	21 47 31.3	1.494
17	5 41 41.67	2.2026	21 45 58.4	1.603
18	5 43 53.76	2.2004	21 44 19.0	1.711
19	5 46 5.72	2.1982	21 42 33.1	1.818
20	5 48 17.54	2.1959	21 40 40.8	1.925
21	5 50 29.23	2.1937	21 38 42.1	2.032
22	5 52 40.78	2.1914	21 36 37.0	2.138
23	5 54 52.19	2.1891	N.21 34 25.6	2.243

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	5 57 3.47	2.1868	N.21 32 7.8	2.349
1	5 59 14.60	2.1843	21 29 43.7	2.454
2	6 1 25.58	2.1818	21 27 13.3	2.558
3	6 3 36.41	2.1793	21 24 36.7	2.663
4	6 5 47.09	2.1768	21 21 53.8	2.767
5	6 7 57.62	2.1742	21 19 4.7	2.870
6	6 10 7.99	2.1715	21 16 9.4	2.972
7	6 12 18.20	2.1689	21 13 8.0	3.075
8	6 14 28.26	2.1663	21 10 0.4	3.177
9	6 16 38.16	2.1636	21 6 46.8	3.278
10	6 18 47.90	2.1609	21 3 27.1	3.378
11	6 20 57.47	2.1582	21 0 1.4	3.477
12	6 23 6.88	2.1554	20 56 29.8	3.577
13	6 25 16.12	2.1526	20 52 52.2	3.676
14	6 27 25.19	2.1497	20 49 8.7	3.775
15	6 29 34.09	2.1469	20 45 19.2	3.874
16	6 31 42.82	2.1441	20 41 23.8	3.971
17	6 33 51.38	2.1412	20 37 22.6	4.067
18	6 35 59.77	2.1383	20 33 15.7	4.163
19	6 38 7.98	2.1353	20 29 3.0	4.260
20	6 40 16.01	2.1324	20 24 44.5	4.356
21	6 42 23.87	2.1295	20 20 20.3	4.450
22	6 44 31.55	2.1264	20 15 50.5	4.543
23	6 46 39.04	2.1233	20 11 15.1	4.637
24	6 48 46.35	2.1203	N.20 6 34.0	4.731

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	6 48 46.35	2.1203	N.20 6 34.0	4.731
1	6 50 53.48	2.1173	20 1 47.4	4.822
2	6 53 0.43	2.1142	19 56 55.3	4.914
3	6 55 7.19	2.1111	19 51 57.7	5.005
4	6 57 13.76	2.1080	19 46 54.7	5.095
5	6 59 20.15	2.1049	19 41 46.3	5.186
6	7 1 26.35	2.1017	19 36 32.4	5.276
7	7 3 32.36	2.0986	19 31 13.2	5.364
8	7 5 38.18	2.0955	19 25 48.8	5.451
9	7 7 43.82	2.0923	19 20 19.1	5.538
10	7 9 49.26	2.0891	19 14 44.2	5.625
11	7 11 54.51	2.0859	19 9 4.1	5.712
12	7 13 59.57	2.0827	19 3 18.8	5.797
13	7 16 4.44	2.0795	18 57 28.4	5.882
14	7 18 9.11	2.0763	18 51 33.0	5.965
15	7 20 13.59	2.0731	18 45 32.6	6.048
16	7 22 17.88	2.0699	18 39 27.2	6.131
17	7 24 21.98	2.0667	18 33 16.8	6.214
18	7 26 25.88	2.0634	18 27 1.5	6.295
19	7 28 29.59	2.0602	18 20 41.4	6.375
20	7 30 33.10	2.0569	18 14 16.5	6.456
21	7 32 36.42	2.0537	18 7 46.7	6.536
22	7 34 39.54	2.0504	18 1 12.2	6.614
23	7 36 42.47	2.0472	N.17 54 33.0	6.692

WEDNESDAY, FEBRUARY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	7 38 45.20	2.0439	N.17 47 49.2	6.769

PHASES OF THE MOON.

	d	h	m
○ Full Moon	3	22	58.5
☾ Last Quarter	12	3	47.6
● New Moon	19	4	35.1
☽ First Quarter . . .	25	19	44.9

	d	h
☾ Apogee	7	15.5
☾ Perigee	20	1.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	α Arietis	W.	32 46 47	2887	34 19 22	2887	35 51 57	2888	37 24 31	2889
	Saturn	W.	31 58 15	2838	33 31 54	2841	35 5 29	2844	36 39 0	2848
	Jupiter	W.	21 8 25	2809	22 42 41	2812	24 16 53	2816	25 51 0	2820
	Pollux	E.	44 31 20	2923	42 59 30	2940	41 28 2	2958	39 56 57	2978
	Regulus	E.	80 44 37	2798	79 10 6	2805	77 35 45	2814	76 1 35	2822
2	α Arietis	W.	45 6 42	2905	46 38 55	2909	48 11 3	2913	49 43 5	2919
	Saturn	W.	44 25 5	2873	45 57 58	2879	47 30 44	2885	49 3 22	2891
	Jupiter	W.	33 39 59	2848	35 13 24	2855	36 46 41	2861	38 19 50	2868
	Regulus	E.	68 13 26	2863	66 40 20	2872	65 7 25	2880	63 34 40	2887
3	α Arietis	W.	57 21 37	2945	58 52 59	2950	60 24 14	2956	61 55 22	2962
	Saturn	W.	56 44 35	2922	58 16 26	2928	59 48 9	2934	61 19 45	2941
	Jupiter	W.	46 3 26	2901	47 35 44	2908	49 7 53	2914	50 39 54	2920
	Aldebaran	W.	24 23 5	3013	25 53 2	3007	27 23 6	3004	28 53 14	3002
	Regulus	E.	55 53 30	2928	54 21 47	2937	52 50 15	2945	51 18 53	2954
4	α Arietis	W.	69 29 12	2991	70 59 36	2997	72 29 53	3002	74 0 3	3008
	Saturn	W.	68 55 41	2972	70 26 29	2978	71 57 9	2985	73 27 41	2991
	Jupiter	W.	58 17 54	2954	59 49 5	2960	61 20 8	2966	62 51 3	2973
	Aldebaran	W.	36 23 58	3008	37 54 1	3011	39 24 0	3014	40 53 55	3018
	Regulus	E.	43 44 45	2997	42 14 28	3006	40 44 23	3016	39 14 30	3025
	Spica	E.	97 30 1	2954	95 58 51	2962	94 27 50	2968	92 56 57	2973
5	α Arietis	W.	81 29 6	3036	82 58 34	3042	84 27 55	3047	85 57 9	3052
	Jupiter	W.	70 23 44	3002	71 53 54	3008	73 23 57	3014	74 53 53	3018
	Aldebaran	W.	48 22 23	3037	49 51 50	3041	51 21 12	3045	52 50 29	3049
	Mars	W.	25 37 57	2993	27 8 19	2986	28 38 49	2982	30 9 24	2980
	Regulus	E.	31 48 9	3079	30 19 34	3092	28 51 15	3106	27 23 13	3121
	Spica	E.	85 24 25	3004	83 54 17	3009	82 24 16	3014	80 54 21	3020
6	α Arietis	W.	93 21 49	3077	94 50 27	3081	96 19 0	3085	97 47 28	3090
	Jupiter	W.	82 21 59	3043	83 51 19	3047	85 20 33	3052	86 49 41	3056
	Aldebaran	W.	60 15 41	3069	61 44 29	3072	63 13 13	3075	64 41 53	3078
	Mars	W.	37 42 47	2977	39 13 28	2979	40 44 7	2980	42 14 45	2981
	Spica	E.	73 26 24	3044	71 57 6	3049	70 27 54	3053	68 58 47	3056
7	Aldebaran	W.	72 4 16	3092	73 32 35	3094	75 0 52	3096	76 29 7	3097
	Mars	W.	49 47 31	2988	51 17 59	2989	52 48 26	2989	54 18 52	2991
	Pollux	W.	31 8 50	3331	32 32 26	3312	33 56 24	3296	35 20 40	3282
	Spica	E.	61 34 16	3073	60 5 33	3075	58 36 53	3078	57 8 16	3079
	Antares	E.	107 1 18	3085	105 32 50	3087	104 4 25	3089	102 36 2	3091
8	Aldebaran	W.	83 49 57	3101	85 18 5	3101	86 46 13	3101	88 14 22	3101
	Mars	W.	61 50 45	2993	63 21 7	2993	64 51 29	2992	66 21 52	2991
	Pollux	W.	42 25 29	3232	43 51 0	3225	45 16 40	3217	46 42 28	3209
	Spica	E.	49 45 39	3085	48 17 11	3085	46 48 43	3085	45 20 15	3084
	Antares	E.	95 14 32	3096	93 46 17	3095	92 18 1	3095	90 49 45	3094
9	Mars	W.	73 54 12	2982	75 24 47	2979	76 55 26	2976	78 26 9	2973
	Pollux	W.	53 53 38	3177	55 20 15	3170	56 47 0	3163	58 13 54	3156
	Spica	E.	37 57 35	3076	36 28 56	3073	35 0 14	3070	33 31 28	3068
	Antares	E.	83 28 3	3085	81 59 35	3082	80 31 3	3079	79 2 28	3075

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	α Arietis	W.	38 57 4	2891	40 29 34	2894	42 2 1	2897	43 34 24	2901
	Saturn	W.	38 12 26	2852	39 45 46	2858	41 18 59	2863	42 52 5	2868
	Jupiter	W.	27 25 2	2825	28 58 57	2831	30 32 45	2836	32 6 26	2842
	Pollux	E.	38 26 17	2998	36 56 2	3020	35 26 14	3044	33 56 56	3071
	Regulus	E.	74 27 36	2831	72 53 48	2838	71 20 10	2847	69 46 43	2855
2	α Arietis	W.	51 15 0	2924	52 46 49	2928	54 18 32	2934	55 50 8	2939
	Saturn	W.	50 35 52	2898	52 8 14	2903	53 40 29	2909	55 12 36	2916
	Jupiter	W.	39 52 50	2874	41 25 42	2881	42 58 25	2887	44 31 0	2894
	Regulus	E.	62 2 5	2896	60 29 41	2904	58 57 27	2912	57 25 23	2920
3	α Arietis	W.	63 26 22	2968	64 57 15	2973	66 28 1	2979	67 58 40	2985
	Saturn	W.	62 51 12	2947	64 22 31	2954	65 53 42	2960	67 24 45	2965
	Jupiter	W.	52 11 47	2927	53 43 31	2934	55 15 7	2940	56 46 35	2947
	Aldebaran	W.	30 23 24	3002	31 53 34	3002	33 23 44	3004	34 53 52	3005
	Regulus	E.	49 47 42	2962	48 16 42	2970	46 45 52	2979	45 15 13	2988
4	α Arietis	W.	75 30 6	3014	77 0 2	3020	78 29 50	3026	79 59 31	3030
	Saturn	W.	74 58 5	2997	76 28 22	3002	77 58 32	3008	79 28 35	3014
	Jupiter	W.	64 21 50	2978	65 52 30	2985	67 23 2	2990	68 53 27	2997
	Aldebaran	W.	42 23 46	3022	43 53 32	3025	45 23 14	3029	46 52 51	3033
	Regulus	E.	37 44 48	3035	36 15 19	3045	34 46 2	3056	33 16 59	3067
	Spica	E.	91 26 11	2980	89 55 33	2986	88 25 3	2992	86 54 40	2998
5	α Arietis	W.	87 26 17	3057	88 55 19	3062	90 24 15	3067	91 53 5	3072
	Jupiter	W.	76 23 43	3024	77 53 26	3029	79 23 3	3034	80 52 34	3039
	Aldebaran	W.	54 19 41	3053	55 48 48	3057	57 17 50	3060	58 46 48	3065
	Mars	W.	31 40 2	2978	33 10 42	2977	34 41 23	2977	36 12 5	2977
	Regulus	E.	25 55 29	3138	24 28 5	3157	23 1 4	3179	21 34 30	3204
	Spica	E.	79 24 33	3025	77 54 51	3030	76 25 16	3035	74 55 47	3040
6	α Arietis	W.	99 15 50	3094	100 44 7	3097	102 12 20	3101	103 40 29	3103
	Jupiter	W.	88 18 44	3060	89 47 43	3063	91 16 38	3066	92 45 29	3069
	Aldebaran	W.	66 10 29	3082	67 39 1	3085	69 7 29	3087	70 35 54	3090
	Mars	W.	43 45 22	2982	45 15 57	2984	46 46 30	2985	48 17 1	2986
	Spica	E.	67 29 44	3060	66 0 46	3064	64 31 52	3067	63 3 2	3070
7	Aldebaran	W.	77 57 20	3099	79 25 31	3101	80 53 40	3101	82 21 49	3101
	Mars	W.	55 49 16	2992	57 19 39	2992	58 50 2	2993	60 20 24	2993
	Pollux	W.	36 45 12	3270	38 9 58	3259	39 34 57	3249	41 0 8	3241
	Spica	E.	55 39 41	3081	54 11 8	3082	52 42 37	3083	51 14 7	3085
	Antares	E.	101 7 41	3091	99 39 21	3093	98 11 3	3095	96 42 47	3096
8	Aldebaran	W.	89 42 31	3100	91 10 41	3098	92 38 53	3096	94 7 8	3093
	Mars	W.	67 52 16	2989	69 22 42	2988	70 53 10	2986	72 23 40	2985
	Pollux	W.	48 8 27	3203	49 34 33	3196	51 0 47	3189	52 27 9	3183
	Spica	E.	43 51 46	3083	42 23 16	3082	40 54 44	3081	39 26 11	3078
	Antares	E.	89 21 28	3093	87 53 10	3091	86 24 50	3090	84 56 28	3087
9	Mars	W.	79 56 56	2969	81 27 48	2965	82 58 45	2960	84 29 48	2954
	Pollux	W.	59 40 56	3148	61 8 7	3142	62 35 26	3134	64 2 54	3127
	Spica	E.	32 2 39	3064	30 33 45	3060	29 4 46	3056	27 35 42	3051
	Antares	E.	77 33 48	3071	76 5 3	3067	74 36 13	3062	73 7 17	3057

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
9	Sun	E.	124° 44′ 55″	3472	123° 24′ 0″	3469	122° 3′ 1″	3464	120° 41′ 57″	3460
10	Mars	W.	86 0 58	2950	87 32 14	2943	89 3 38	2937	90 35 10	2931
	Pollux	W.	65 30 31	3119	66 58 18	3110	68 26 15	3102	69 54 22	3094
	Regulus	W.	28 28 33	3123	29 56 15	3109	31 24 14	3096	32 52 29	3082
	Antares	E.	71 38 15	3052	70 9 6	3045	68 39 49	3039	67 10 24	3031
	Sun	E.	113 55 16	3431	112 33 35	3425	111 11 47	3417	109 49 50	3409
11	Pollux	W.	77 17 43	3045	78 47 0	3034	80 16 30	3023	81 46 14	3012
	Regulus	W.	40 17 37	3020	41 47 25	3008	43 17 28	2994	44 47 48	2981
	Antares	E.	59 41 1	2991	58 10 37	2982	56 40 2	2972	55 9 14	2962
	Sun	E.	102 57 40	3362	101 34 40	3351	100 11 28	3340	98 48 3	3329
12	Pollux	W.	89 18 33	2950	90 49 48	2937	92 21 20	2924	93 53 9	2909
	Regulus	W.	52 23 37	2912	53 55 40	2898	55 28 1	2883	57 0 41	2868
	Antares	E.	47 31 57	2907	45 59 47	2894	44 27 21	2883	42 54 40	2870
	Sun	E.	91 47 25	3263	90 22 30	3248	88 57 18	3233	87 31 48	3218
13	Regulus	W.	64 49 4	2788	66 23 48	2770	67 58 55	2753	69 34 24	2736
	Antares	E.	35 7 10	2806	33 32 50	2794	31 58 14	2782	30 23 22	2769
	Sun	E.	80 19 37	3136	78 52 11	3118	77 24 23	3100	75 56 13	3082
14	Regulus	W.	77 37 43	2646	79 15 36	2626	80 53 55	2607	82 32 40	2589
	Spica	W.	23 35 20	2635	25 13 28	2615	26 52 3	2596	28 31 4	2576
	Sun	E.	68 29 42	2987	66 59 13	2967	65 28 19	2946	63 56 59	2927
15	Regulus	W.	90 52 55	2493	92 34 18	2474	94 16 8	2455	95 58 25	2436
	Spica	W.	36 52 56	2477	38 34 41	2458	40 16 53	2438	41 59 33	2419
	Sun	E.	56 14 0	2826	54 40 6	2807	53 5 47	2787	51 31 2	2766
16	Regulus	W.	104 36 31	2343	106 21 28	2325	108 6 51	2308	109 52 39	2290
	Spica	W.	50 39 45	2324	52 25 9	2306	54 11 0	2287	55 57 18	2270
	Sun	E.	43 30 44	2670	41 53 24	2652	40 15 40	2635	38 37 32	2618
17	Regulus	W.	118 47 53	2210	120 36 6	2196	122 24 40	2182	124 13 35	2168
	Spica	W.	64 55 15	2185	66 44 5	2170	68 33 18	2155	70 22 54	2140
	Sun	E.	30 21 20	2543	28 41 7	2532	27 0 38	2521	25 19 54	2513
21	Sun	W.	26 7 47	2368	27 52 8	2370	29 36 26	2373	31 20 40	2378
	α Arietis	E.	68 24 54	2053	66 32 42	2061	64 40 43	2070	62 48 58	2079
	Saturn	E.	68 59 10	2039	67 6 37	2047	65 14 16	2055	63 22 7	2064
	Jupiter	E.	79 27 18	2028	77 34 28	2035	75 41 49	2043	73 49 22	2051
	Aldebaran	E.	101 27 3	2032	99 34 18	2039	97 41 44	2046	95 49 21	2054
22	Sun	W.	39 59 34	2418	41 42 43	2429	43 25 37	2440	45 8 15	2453
	α Arietis	E.	53 34 16	2139	51 44 17	2154	49 54 40	2169	48 5 26	2186
	Saturn	E.	54 5 9	2118	52 14 38	2131	50 24 26	2145	48 34 35	2159
	Jupiter	E.	64 30 36	2102	62 39 40	2114	60 49 2	2126	58 58 43	2139
	Aldebaran	E.	86 30 52	2103	84 39 58	2115	82 49 21	2126	80 59 2	2139
23	Sun	W.	53 36 50	2521	55 17 34	2537	56 57 56	2552	58 37 57	2568
	α Arietis	E.	39 5 49	2281	37 19 22	2304	35 33 29	2328	33 48 11	2355
	Saturn	E.	39 31 1	2240	37 43 33	2259	35 56 33	2278	34 10 1	2298

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Sun	E.	119° 20′ 48″	3455	117° 59′ 34″	3451	116° 38′ 15″	3445	115° 16′ 49″	3438
10	Mars	W.	92 6 50	2924	93 38 39	2916	95 10 37	2909	96 42 45	2900
	Pollux	W.	71 22 39	3085	72 51 7	3075	74 19 47	3065	75 48 39	3056
	Regulus	W.	34 21 0	3070	35 49 46	3057	37 18 48	3045	38 48 5	3033
	Antares	E.	65 40 50	3025	64 11 8	3017	62 41 16	3009	61 11 14	3000
	Sun	E.	108 27 44	3401	107 5 29	3393	105 43 4	3383	104 20 28	3372
11	Pollux	W.	83 16 12	3001	84 46 24	2989	86 16 51	2976	87 47 34	2963
	Regulus	W.	46 18 24	2969	47 49 16	2955	49 20 25	2941	50 51 52	2927
	Antares	E.	53 38 14	2952	52 7 1	2941	50 35 34	2930	49 3 53	2918
	Sun	E.	97 24 25	3317	96 0 33	3304	94 36 26	3291	93 12 4	3276
12	Pollux	W.	95 25 16	2894	96 57 42	2880	98 30 26	2866	100 3 28	2852
	Regulus	W.	58 33 41	2852	60 7 1	2837	61 40 41	2821	63 14 42	2805
	Antares	E.	41 21 43	2858	39 48 30	2845	38 15 0	2831	36 41 13	2819
	Sun	E.	86 6 0	3202	84 39 53	3186	83 13 27	3170	81 46 42	3153
13	Regulus	W.	71 10 16	2718	72 46 32	2701	74 23 11	2682	76 0 15	2664
	Antares	E.	28 48 14	2759	27 12 52	2748	25 37 16	2739	24 1 28	2732
	Sun	E.	74 27 41	3063	72 58 46	3044	71 29 28	3026	69 59 47	3006
14	Regulus	W.	84 11 50	2570	85 51 26	2551	87 31 29	2531	89 11 59	2512
	Spica	W.	30 10 32	2556	31 50 27	2537	33 30 49	2517	35 11 39	2497
	Sun	E.	62 25 14	2907	60 53 4	2887	59 20 29	2867	57 47 28	2846
15	Regulus	W.	97 41 8	2417	99 24 18	2398	101 7 56	2380	102 52 0	2361
	Spica	W.	43 42 40	2400	45 26 15	2380	47 10 18	2362	48 54 48	2343
	Sun	E.	49 55 50	2747	48 20 12	2727	46 44 8	2708	45 7 39	2689
16	Regulus	W.	111 38 53	2273	113 25 32	2257	115 12 35	2241	117 0 2	2225
	Spica	W.	57 44 2	2252	59 31 12	2235	61 18 48	2218	63 6 49	2201
	Sun	E.	36 59 1	2601	35 20 7	2585	33 40 52	2570	32 1 16	2556
17	Regulus	W.	126 2 51	5155	127 52 26	2144	129 42 18	2133	131 32 27	2122
	Spica	W.	72 12 52	2126	74 3 11	2113	75 53 51	2099	77 44 51	2087
	Sun	E.	23 38 59	2507	21 57 56	2504	20 16 49	2505	18 35 43	3512
21	Sun	W.	33 4 47	2384	34 48 45	2391	36 32 33	2398	38 16 10	2408
	α Arietis	E.	60 57 27	2090	59 6 12	2101	57 15 15	2113	55 24 36	2126
	Saturn	E.	61 30 12	2073	59 38 32	2083	57 47 7	2094	55 55 59	2106
	Jupiter	E.	71 57 7	2060	70 5 6	2070	68 13 20	2080	66 21 50	2090
	Aldebaran	E.	93 57 11	2062	92 5 14	2072	90 13 31	2081	88 22 3	2092
22	Sun	W.	46 50 35	2465	48 32 37	2478	50 14 21	2492	51 55 46	2507
	α Arietis	E.	46 16 37	2203	44 28 14	2220	42 40 17	2239	40 52 48	2260
	Saturn	E.	46 45 6	2174	44 55 59	2189	43 7 15	2205	41 18 55	2223
	Jupiter	E.	57 8 43	2152	55 19 3	2166	53 29 44	2180	51 40 47	2195
	Aldebaran	E.	79 9 3	2153	77 19 24	2166	75 30 5	2180	73 41 8	2194
23	Sun	W.	60 17 36	2584	61 56 53	2601	63 35 47	2618	65 14 18	2634
	α Arietis	E.	32 3 31	2383	30 19 32	2414	28 36 17	2448	26 53 50	2485
	Saturn	E.	32 23 58	2319	30 38 26	2342	28 53 27	2366	27 9 3	2392

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	JUPITER	E.	49° 52′ 12″	2210	48° 3′ 59″	2225	46° 16′ 9″	2241	44° 28′ 43″	2257
	Aldebaran	E.	71 52 32	2210	70 4 19	2225	68 16 28	2240	66 29 0	2256
	MARS	E.	90 25 21	2167	88 36 4	2182	86 47 10	2198	84 58 39	2214
24	SUN	W.	66 52 27	2651	68 30 13	2669	70 7 35	2686	71 44 34	2703
	Fomalhaut	W.	45 55 19	3312	47 19 17	3273	48 44 0	3239	50 9 23	3211
	JUPITER	E.	35 37 32	2342	33 52 33	2359	32 7 59	2378	30 23 52	2396
	Aldebaran	E.	57 37 39	2339	55 52 36	2357	54 7 59	2374	52 23 47	2392
	MARS	E.	76 2 1	2296	74 15 55	2312	72 30 13	2329	70 44 56	2346
25	SUN	W.	79 43 41	2791	81 18 21	2806	82 52 39	2825	84 26 34	2843
	Fomalhaut	W.	57 23 5	3127	58 50 42	3119	60 18 29	3113	61 46 23	3109
	α Pegasi	W.	36 15 49	2852	37 49 9	2838	39 22 48	2828	40 56 40	2820
	MARS	E.	62 4 44	2433	60 21 56	2450	58 39 32	2467	56 57 33	2485
	Aldebaran	E.	43 49 13	2483	42 7 36	2502	40 26 26	2522	38 45 43	2541
	Pollux	E.	86 2 27	2512	84 21 30	2529	82 40 57	2545	81 0 47	2562
26	SUN	W.	92 10 37	2927	93 42 22	2943	95 13 46	2960	96 44 49	2976
	Fomalhaut	W.	69 6 29	3111	70 34 25	3115	72 2 16	3120	73 30 1	3126
	α Pegasi	W.	48 47 24	2815	50 21 32	2819	51 55 35	2824	53 29 32	2828
	MARS	E.	48 33 43	2572	46 54 9	2589	45 14 59	2607	43 36 13	2624
	Pollux	E.	72 45 39	2645	71 7 45	2662	69 30 14	2678	67 53 5	2695
27	SUN	W.	104 15 11	3052	105 44 19	3067	107 13 9	3082	108 41 41	3096
	Fomalhaut	W.	80 46 44	3166	82 13 34	3175	83 40 13	3184	85 6 41	3194
	α Pegasi	W.	61 17 21	2863	62 50 27	2872	64 23 22	2880	65 56 7	2888
	MARS	E.	35 28 19	2713	33 51 57	2732	32 15 59	2750	30 40 26	2771
	Pollux	E.	59 52 51	2778	58 17 54	2794	56 43 18	2811	55 9 4	2828
	Regulus	E.	96 25 2	2703	94 48 26	2716	93 12 7	2729	91 36 5	2741
28	SUN	W.	116 0 11	3163	117 27 5	3175	118 53 44	3188	120 20 8	3199
	α Arietis	W.	29 59 0	2920	31 30 54	2919	33 2 49	2919	34 34 44	2921
	SATURN	W.	28 39 25	2864	30 12 30	2869	31 45 29	2875	33 18 20	2880
	Pollux	E.	47 23 24	2915	45 51 24	2933	44 19 47	2952	42 48 34	2972
	Regulus	E.	83 40 1	2801	82 5 35	2813	80 31 24	2824	78 57 27	2835
29	α Arietis	W.	42 13 24	2939	43 44 53	2944	45 16 16	2950	46 47 32	2954
	SATURN	W.	41 0 35	2914	42 32 36	2921	44 4 28	2928	45 36 11	2935
	JUPITER	W.	30 11 32	2903	31 43 47	2911	33 15 52	2919	34 47 47	2926
	Pollux	E.	35 19 1	3086	33 50 34	3114	32 22 41	3143	30 55 24	3178
	Regulus	E.	71 11 5	2885	69 38 27	2894	68 6 1	2904	66 33 47	2912
30	α Arietis	W.	54 22 16	2981	55 52 53	2986	57 23 23	2991	58 53 47	2997
	SATURN	W.	53 12 37	2968	54 43 30	2974	56 14 15	2981	57 44 52	2986
	JUPITER	W.	42 25 4	2962	43 56 5	2969	45 26 57	2975	46 57 41	2981
	Aldebaran	W.	21 25 1	3067	22 53 51	3056	24 22 54	3050	25 52 5	3045
	Regulus	E.	58 55 24	2955	57 24 15	2964	55 53 17	2972	54 22 29	2979
31	α Arietis	W.	66 24 11	3021	67 53 58	3025	69 23 40	3030	70 53 16	3034
	SATURN	W.	65 16 10	3014	66 46 5	3019	68 15 54	3024	69 45 37	3029
	JUPITER	W.	54 29 25	3011	55 59 24	3016	57 29 17	3021	58 59 4	3026
	Aldebaran	W.	33 18 53	3041	34 48 15	3041	36 17 37	3042	37 46 58	3043
	Regulus	E.	46 50 49	3017	45 20 57	3024	43 51 14	3032	42 21 41	3039

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Jupiter	E.	42° 41′ 40″	2273	40° 55′ 1″	2290	39° 8′ 47″	2307	37° 22′ 57″	2324
	Aldebaran	E.	64 41 56	2272	62 55 15	2289	61 8 59	2305	59 23 7	2322
	Mars	E.	83 10 32	2229	81 22 48	2245	79 35 28	2262	77 48 32	2279
24	Sun	W.	73 21 10	2720	74 57 23	2738	76 33 12	2756	78 8 38	2773
	Fomalhaut	W.	51 35 19	3187	53 1 44	3168	54 28 32	3151	55 55 40	3137
	Jupiter	E.	28 40 11	2415	26 56 57	2434	25 14 11	2454	23 31 53	2475
	Aldebaran	E.	50 40 1	2410	48 56 40	2428	47 13 45	2446	45 31 16	2465
	Mars	E.	69 0 4	2364	67 15 37	2381	65 31 35	2398	63 47 57	2415
25	Sun	W.	86 0 6	2860	87 33 16	2876	89 6 5	2894	90 38 32	2911
	Fomalhaut	W.	63 14 22	3106	64 42 24	3105	66 10 27	3106	67 38 29	3108
	α Pegasi	W.	42 30 42	2815	44 4 50	2813	45 39 1	2812	47 13 13	2813
	Mars	E.	55 15 59	2502	53 34 49	2520	51 54 3	2537	50 13 41	2554
	Aldebaran	E.	37 5 27	2561	35 25 38	2582	33 46 18	2603	32 7 27	2624
	Pollux	E.	79 21 0	2579	77 41 36	2595	76 2 34	2612	74 23 55	2629
26	Sun	W.	98 15 32	2991	99 45 56	3007	101 16 0	3022	102 45 45	3038
	Fomalhaut	W.	74 57 39	3133	76 25 9	3140	77 52 30	3148	79 19 42	3156
	α Pegasi	W.	55 3 23	2835	56 37 6	2842	58 10 40	2848	59 44 5	2855
	Mars	E.	41 57 51	2641	40 19 52	2659	38 42 17	2677	37 5 6	2695
	Pollux	E.	66 16 18	2711	64 39 53	2729	63 3 51	2744	61 28 10	2761
27	Sun	W.	110 9 56	3110	111 37 54	3123	113 5 36	3137	114 33 1	3149
	Fomalhaut	W.	86 32 57	3205	87 59 0	3217	89 24 49	3229	90 50 24	3241
	α Pegasi	W.	67 28 41	2897	69 1 4	2906	70 33 15	2915	72 5 15	2924
	Mars	E.	29 5 20	2792	27 30 41	2814	25 56 31	2838	24 22 52	2863
	Pollux	E.	53 35 12	2844	52 1 41	2862	50 28 33	2879	48 55 47	2897
	Regulus	E.	90 0 20	2754	88 24 52	2766	86 49 40	2778	85 14 43	2789
28	Sun	W.	121 46 18	3211	123 12 14	3223	124 37 56	3235	126 3 24	3246
	α Arietis	W.	36 6 36	2924	37 38 25	2927	39 10 10	2931	40 41 50	2935
	Saturn	W.	34 51 4	2887	36 23 40	2894	37 56 7	2901	39 28 25	3907
	Pollux	E.	41 17 46	2992	39 47 23	3014	38 17 27	3036	36 47 59	3060
	Regulus	E.	77 23 44	2845	75 50 15	2855	74 16 59	2866	72 43 56	2875
29	α Arietis	W.	48 18 42	2960	49 49 45	2965	51 20 42	2970	52 51 32	2975
	Saturn	W.	47 7 45	2942	48 39 10	2949	50 10 27	2955	51 41 36	2962
	Jupiter	W.	36 19 33	2933	37 51 10	2941	39 22 37	2948	40 53 55	2955
	Pollux	E.	29 28 48	3214	28 2 56	3256	26 37 53	3304	25 13 46	3358
	Regulus	E.	65 1 44	2921	63 29 52	2931	61 58 12	2939	60 26 43	2947
30	α Arietis	W.	60 24 4	3001	61 54 15	3006	63 24 20	3012	64 54 18	3016
	Saturn	W.	59 15 22	2992	60 45 45	2998	62 16 0	3004	63 46 8	3009
	Jupiter	W.	48 28 17	2988	49 58 45	2993	51 29 6	3000	52 59 19	3005
	Aldebaran	W.	27 21 22	3042	28 50 43	3040	30 20 6	3039	31 49 30	3040
	Regulus	E.	52 51 50	2987	51 21 21	2994	49 51 1	3001	48 20 50	3009
31	α Arietis	W.	72 22 47	3039	73 52 12	3043	75 21 32	3047	76 50 47	3051
	Saturn	W.	71 15 14	3034	72 44 45	3038	74 14 11	3043	75 43 31	3047
	Jupiter	W.	60 28 44	3031	61 58 18	3036	63 27 46	3040	64 57 9	3045
	Aldebaran	W.	39 16 17	3045	40 45 34	3047	42 14 48	3050	43 43 59	3052
	Regulus	E.	40 42 17	3047	39 23 3	3055	37 53 58	3063	36 25 3	3071

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	21 0 15.39	10.176	S. 17 2 12.5	+42.83	16 15.98	68.24	13 51.41	0.318
Thur.	2	21 4 19.21	10.142	16 44 55.2	43.57	16 15.83	68.13	13 58.65	0.284
Frid.	3	21 8 22.20	10.107	16 27 20.5	44.30	16 15.67	68.01	14 5.06	0.250
Sat.	4	21 12 24.37	10.073	16 9 28.5	+45.00	16 15.51	67.90	14 10.66	0.216
Sun.	5	21 16 25.72	10.040	15 51 19.9	45.70	16 15.35	67.78	14 15.45	0.183
Mon.	6	21 20 26.27	10.007	15 32 55.0	46.37	16 15.17	67.67	14 19.43	0.150
Tues.	7	21 24 26.02	9.974	15 14 14.1	+47.04	16 14.99	67.55	14 22.62	0.117
Wed.	8	21 28 24.99	9.941	14 55 17.6	47.67	16 14.81	67.44	14 25.02	0.084
Thur.	9	21 32 23.18	9.909	14 36 6.1	48.28	16 14.63	67.33	14 26.66	0.052
Frid.	10	21 36 20.59	9.877	14 16 39.8	+48.89	16 14.44	67.22	14 27.53	0.020
Sat.	11	21 40 17.25	9.846	13 56 59.3	49.48	16 14.24	67.11	14 27.63	0.011
Sun.	12	21 44 13.16	9.815	13 37 4.8	50.04	16 14.05	67.00	14 26.98	0.042
Mon.	13	21 48 8.33	9.784	13 16 56.9	+50.60	16 13.85	66.89	14 25.61	0.073
Tues.	14	21 52 2.77	9.753	12 56 36.0	51.13	16 13.65	66.78	14 23.50	0.104
Wed.	15	21 55 56.48	9.722	12 36 2.5	51.65	16 13.44	66.68	14 20.66	0.134
Thur.	16	21 59 49.48	9.692	12 15 16.8	+52.14	16 13.24	66.57	14 17.11	0.164
Frid.	17	22 3 41.76	9.663	11 54 19.6	52.62	16 13.03	66.47	14 12.85	0.193
Sat.	18	22 7 33.34	9.634	11 33 11.1	53.07	16 12.82	66.37	14 7.89	0.222
Sun.	19	22 11 24.24	9.606	11 11 51.7	+53.53	16 12.60	66.27	14 2.25	0.250
Mon.	20	22 15 14.46	9.578	10 50 21.8	53.94	16 12.39	66.17	13 55.93	0.278
Tues.	21	22 19 4.01	9.551	10 28 42.0	54.36	16 12.17	66.08	13 48.95	0.305
Wed.	22	22 22 52.92	9.524	10 6 52.8	+54.74	16 11.95	65.99	13 41.32	0.332
Thur.	23	22 26 41.18	9.497	9 44 54.1	55.11	16 11.73	65.90	13 33.05	0.359
Frid.	24	22 30 28.81	9.472	9 22 46.8	55.47	16 11.51	65.81	13 24.16	0.384
Sat.	25	22 34 15.83	9.447	9 0 31.3	+55.81	16 11.28	65.73	13 14.65	0.409
Sun.	26	22 38 2.25	9.423	8 38 7.9	56.13	16 11.05	65.65	13 4.54	0.433
Mon.	27	22 41 48.09	9.399	8 15 37.0	56.44	16 10.81	65.57	12 53.87	0.457
Tues.	28	22 45 33.39	9.376	7 52 58.9	56.73	16 10.58	65.49	12 42.63	0.480
Wed.	29	22 49 18.10	9.353	S. 7 30 14.1	+57.00	16 10.34	65.42	12 30.84	0.503

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	21 0 13.04	10.175	S. 17 2 22.4	+42.82	13 51.34	0.318	20 46 21.70
Thur.	2	21 4 16.84	10.141	16 45 5.4	43.57	13 58.58	0.284	20 50 18.26
Frid.	3	21 8 19.82	10.107	16 27 30.9	44.30	14 5.01	0.250	20 54 14.81
Sat.	4	21 12 21.98	10.073	16 9 39.2	+44.99	14 10.61	0.216	20 58 11.37
Sun.	5	21 16 23.33	10.040	15 51 30.8	45.69	14 15.41	0.183	21 2 7.92
Mon.	6	21 20 23.88	10.007	15 33 6.1	46.36	14 19.40	0.150	21 6 4.48
Tues.	7	21 24 23.63	9 974	15 14 25.4	+47.03	14 22.60	0.117	21 10 1.03
Wed.	8	21 28 22.60	9.941	14 55 29.1	47.66	14 25.01	0.084	21 13 57.59
Thur.	9	21 32 20.79	9.909	14 36 17.7	48.28	14 26.65	0.052	21 17 54.14
Frid.	10	21 36 18.21	9.877	14 16 51.6	+48.88	14 27.51	0.020	21 21 50.70
Sat.	11	21 40 14.88	9.846	13 57 11.2	49.47	14 27.63	0.011	21 25 47.25
Sun.	12	21 44 10.80	9.815	13 37 16.9	50.03	14 26.99	0.042	21 29 43.81
Mon.	13	21 48 5.98	9.784	13 17 9.1	+50.59	14 25.63	0.073	21 33 40.35
Tues.	14	21 52 0.43	9.753	12 56 48.3	51.12	14 23.52	0.104	21 37 36.91
Wed.	15	21 55 54.16	9.723	12 36 14.9	51.65	14 20.70	0.134	21 41 33.46
Thur.	16	21 59 47.17	9.693	12 15 29.3	+52.14	14 17.15	0.164	21 45 30.02
Frid.	17	22 3 39.47	9.664	11 54 32.1	52.62	14 12.90	0.193	21 49 26.57
Sat.	18	22 7 31.07	9.635	11 33 23.6	53.07	14 7.94	0.222	21 53 23.13
Sun.	19	22 11 21.99	9.607	11 12 4.2	+53.53	14 2.31	0.250	21 57 19.68
Mon.	20	22 15 12.23	9.579	10 50 34.3	53.96	13 55.99	0.278	22 1 16.24
Tues.	21	22 19 1.81	9.552	10 28 54.5	54.36	13 49.02	0.305	22 5 12.79
Wed.	22	22 22 50.74	9.525	10 7 5.3	+54.74	13 41.39	0.332	22 9 9.35
Thur.	23	22 26 39.03	9.498	9 45 6.5	55.11	13 33.14	0.359	22 13 5.89
Frid.	24	22 30 26.69	9.473	9 22 59.2	55.47	13 24.24	0.384	22 17 2.45
Sat.	25	22 34 13.74	9.448	9 0 43.6	+55.81	13 14.74	0.409	22 20 59.00
Sun.	26	22 38 0.19	9.424	8 38 20.1	56.13	13 4.63	0.433	22 24 55.56
Mon.	27	22 41 46.06	9.400	8 15 49.1	56.44	12 53.96	0.457	22 28 52.10
Tues.	28	22 45 31.39	9.377	7 53 10.9	56.73	12 42.73	0.480	22 32 48.66
Wed.	29	22 49 16.15	9.354	S. 7 30 26.0	+57.01	12 30.94	0.503	22 36 45.21

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.	Diff. for 1 Hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	32	312 35 33.4	35 11.7	152.09	− 0.05	9.9937321	+ 27.4	3 13 6.58
2	33	313 36 23.0	36 1.2	152.04	0.13	9.9937990	28.4	3 9 10.67
3	34	314 37 11.3	36 49.4	151.99	0.18	9.9938683	29.4	3 5 14.76
4	35	315 37 58.5	37 36.5	151.95	− 0.20	9.9939400	+ 30.4	3 1 18.85
5	36	316 38 44.6	38 22.4	151.90	0.20	9.9940141	31.4	2 57 22.94
6	37	317 39 29.6	39 7.3	151.85	0.16	9.9940906	32.4	2 53 27.03
7	38	318 40 13.4	39 51.0	151.80	− 0.10	9.9941694	+ 33.3	2 49 31.12
8	39	319 40 56.1	40 33.6	151.75	− 0.01	9.9942504	34.2	2 45 35.21
9	40	320 41 37.8	41 15.2	151.71	+ 0.09	9.9943334	35.0	2 41 39.31
10	41	321 42 18.5	41 55.7	151.66	+ 0.22	9.9944182	+ 35.7	2 37 43.40
11	42	322 42 58.1	42 35.2	151.62	0.35	9.9945047	36.4	2 33 47.49
12	43	323 43 36.5	43 13.5	151.57	0.48	9.9945928	37.0	2 29 51.58
13	44	324 44 13.7	43 50.6	151.52	+ 0.61	9.9946822	+ 37.5	2 25 55.68
14	45	325 44 49.7	44 26.5	151.47	0.72	9.9947727	38.0	2 21 59.77
15	46	326 45 24.4	45 1.0	151.42	0.82	9.9948644	38.5	2 18 3.86
16	47	327 45 57.8	45 34.3	151.36	+ 0.88	9.9949570	+ 38.8	2 14 7.95
17	48	328 46 29.7	46 6.1	151.30	0.92	9.9950508	39.2	2 10 12.04
18	49	329 47 0.1	46 36.4	151.23	0.94	9.9951454	39.5	2 6 16.13
19	50	330 47 28.9	47 5.1	151.16	+ 0.91	9.9952408	+ 39.9	2 2 20.22
20	51	331 47 55.9	47 32.0	151.09	0.86	9.9953371	40.2	1 58 24.31
21	52	332 48 21.1	47 57.1	151.01	0.78	9.9954342	40.6	1 54 28.41
22	53	333 48 44.5	48 20.4	150.93	+ 0.69	9.9955321	+ 41.0	1 50 32.50
23	54	334 49 6.0	48 41.8	150.85	0.57	9.9956310	41.4	1 46 36.59
24	55	335 49 25.5	49 1.2	150.77	0.44	9.9957309	41.9	1 42 40.68
25	56	336 49 43.0	49 18.6	150.69	+ 0.30	9.9958320	+ 42.4	1 38 44.78
26	57	337 49 58.5	49 34.0	150.61	0.17	9.9959343	42.9	1 34 48.87
27	58	338 50 12.0	49 47.4	150.52	+ 0.04	9.9960379	43.4	1 30 52.96
28	59	339 50 23.4	49 58.7	150.43	− 0.08	9.9961429	44.0	1 26 57.05
29	60	340 50 32.7	50 7.9	150.34	− 0.17	9.9962493	+ 44.6	1 23 1.15

Note.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 49.9	14 48.0	54 19.0	−0.62	54 12.2	−0.52	11 13.3	1.90	12.8
2	14 46.5	14 45.3	54 6.6	0.42	54 2.3	0.31	11 58.0	1.82	13.8
3	14 44.5	14 44.0	53 59.2	−0.21	53 57.3	−0.11	12 41.0	1.76	14.8
4	14 43.8	14 44.0	53 56.7	+0.01	53 57.5	+0 13	13 22.8	1.72	15.8
5	14 44.7	14 45.7	53 59.8	0.25	54 3.5	0.38	14 4.0	1.71	16.8
6	14 47.1	14 49.1	54 8.9	0.52	54 16.0	0.66	14 45.4	1.74	17.8
7	14 51.5	14 54.4	54 24.9	+0.82	54 35.7	+0.98	15 27.8	1.80	18.8
8	14 57.9	15 2.0	54 48.5	1.15	55 3.3	1.31	16 12.0	1.89	19.8
9	15 6.5	15 11.7	55 20.1	1.48	55 39.0	1.65	16 58.7	2.01	20.8
10	15 17.4	15 23.6	55 59.9	+1.82	56 22.8	+1.97	17 48.4	2.15	21.8
11	15 30.3	15 37.5	56 47.4	2.12	57 13.7	2.24	18 41.6	2.29	22.8
12	15 45.0	15 52.7	57 41.3	2.34	58 9.8	2.39	19 37.9	2.40	23.8
13	16 0.6	16 8.4	58 38.6	+2.40	59 7.3	+2.37	20 36.4	2.47	24.8
14	16 16.0	16 23.2	59 35.2	2.27	60 1.6	2.12	21 35.9	2.47	25.8
15	16 29.7	16 35.5	60 25.7	1.90	60 46.8	1.61	22 34.9	2.43	26.8
16	16 40.2	16 43.7	61 4.1	+1.27	61 17.0	+0.90	23 32.6	2.37	27.8
17	16 46.0	16 46.8	61 25.3	+0.49	61 28.4	+0.05	6		28.8
18	16 46.3	16 44.3	61 26.4	−0.38	61 19.2	−0.80	0 28.7	2.30	0.4
19	16 41.0	16 36.5	61 7.2	−1.19	60 50.7	−1.54	1 23.4	2.26	1.4
20	16 31 0	16 24.6	60 30.4	1.84	60 6.9	2.07	2 17.3	2.23	2.4
21	16 17.5	16 10.0	59 40.9	2.25	59 13 2	2.36	3 10.8	2.23	3.4
22	16 2.1	15 54.3	58 44.5	−2.41	58 15.4	−2.42	4 4.3	2.23	4.4
23	15 46.4	15 38.8	57 46.6	2.38	57 18.6	2.29	4 57.8	2.23	5.4
24	15 31.5	15 24.6	56 51.8	2.18	56 26.6	2.05	5 51.1	2.21	6.4
25	15 18.2	15 12.3	56 3.1	−1.90	55 41.4	−1.72	6 43.6	2.16	7.4
26	15 7.0	15 2.3	55 21.8	1.54	55 4.4	1.36	7 34.7	2.09	8.4
27	14 58.1	14 54.5	54 49.2	1.19	54 36.0	1.01	8 23.9	2.00	9.4
28	14 51.5	14 49.0	54 24.9	−0.84	54 15.8	−0.68	9 11.0	1.92	10.4
29	14 47.1	14 45.6	54 8.6	−0.53	54 3.2	−0.38	9 56.1	1.84	11.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	WEDNESDAY 1.					FRIDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 38 45.20	2.0439	N.17 47 49.2	6.769	0	9 13 19.51	1.9037	N.11 7 10.0	9.653
1	7 40 47.74	2.0407	17 41 0.7	6.846	1	9 15 13.66	1.9014	10 57 29.5	9.696
2	7 42 50.08	2.0374	17 34 7.7	6.922	2	9 17 7.68	1.8991	10 47 46.5	9.738
3	7 44 52.23	2.0342	17 27 10.1	6.997	3	9 19 1.56	1.8968	10 38 1.0	9.779
4	7 46 54.19	2.0310	17 20 8.0	7.072	4	9 20 55.30	1.8946	10 28 13.0	9.820
5	7 48 55.95	2.0278	17 13 1.5	7.145	5	9 22 48.91	1.8924	10 18 22.6	9.859
6	7 50 57.52	2.0246	17 5 50.6	7.218	6	9 24 42.39	1.8902	10 8 29.9	9.898
7	7 52 58.90	2.0213	16 58 35.3	7.291	7	9 26 35.74	1.8881	9 58 34.8	9.937
8	7 55 0.08	2.0181	16 51 15.7	7.363	8	9 28 28.96	1.8860	9 48 37.4	9.976
9	7 57 1.07	2.0149	16 43 51.7	7.435	9	9 30 22.06	1.8840	9 38 37.7	10.013
10	7 59 1.87	2.0117	16 36 23.5	7.504	10	9 32 15.04	1.8820	9 28 35.8	10.049
11	8 1 2.48	2.0086	16 28 51.2	7.573	11	9 34 7.90	1.8799	9 18 31.8	10.085
12	8 3 2.90	2.0054	16 21 14.7	7.642	12	9 36 0.63	1.8779	9 8 25.6	10.121
13	8 5 3.12	2.0022	16 13 34.1	7.711	13	9 37 53.25	1.8761	8 58 17.3	10.155
14	8 7 3.16	1.9991	16 5 49.4	7.778	14	9 39 45.76	1.8742	8 48 7.0	10.189
15	8 9 3.01	1.9959	15 58 0.7	7.845	15	9 41 38.15	1.8723	8 37 54.6	10.223
16	8 11 2.67	1.9928	15 50 8.0	7.912	16	9 43 30.43	1.8705	8 27 40.2	10.256
17	8 13 2.15	1.9897	15 42 11.3	7.977	17	9 45 22.61	1.8688	8 17 23.9	10.287
18	8 15 1.44	1.9866	15 34 10.7	8.042	18	9 47 14.69	1.8671	8 7 5.8	10.318
19	8 17 0.54	1.9835	15 26 6.2	8.106	19	9 49 6.66	1.8654	7 56 45.8	10.348
20	8 18 59.46	1.9805	15 17 58.0	8.169	20	9 50 58.53	1.8637	7 46 24.0	10.378
21	8 20 58.20	1.9774	15 9 46.0	8.232	21	9 52 50.30	1.8621	7 36 0.4	10.407
22	8 22 56.75	1.9744	15 1 30.2	8.293	22	9 54 41.98	1.8606	7 25 35.1	10.436
23	8 24 55.13	1.9715	N.14 53 10.8	8.354	23	9 56 33.57	1.8590	N. 7 15 8.1	10.464
	THURSDAY 2.					SATURDAY 4.			
0	8 26 53.33	1.9685	N.14 44 47.7	8.415	0	9 58 25.06	1.8574	N. 7 4 39.4	10.491
1	8 28 51.35	1.9655	14 36 21.0	8.475	1	10 0 16.46	1.8560	6 54 9.2	10.517
2	8 30 49.19	1.9625	14 27 50.7	8.534	2	10 2 7.78	1.8547	6 43 37.4	10.543
3	8 32 46.85	1.9596	14 19 16.9	8.592	3	10 3 59.02	1.8533	6 33 4.0	10.569
4	8 34 44.34	1.9567	14 10 39.7	8.649	4	10 5 50.18	1.8520	6 22 29.1	10.593
5	8 36 41.65	1.9538	14 1 59.0	8.707	5	10 7 41.26	1.8507	6 11 52.8	10.617
6	8 38 38.79	1.9509	13 53 14.9	8.763	6	10 9 32.26	1.8494	6 1 15.1	10.640
7	8 40 35.76	1.9481	13 44 27.4	8.818	7	10 11 23.19	1.8482	5 50 36.0	10.662
8	8 42 32.56	1.9453	13 35 36.7	8.873	8	10 13 14.05	1.8471	5 39 55.6	10.684
9	8 44 29.19	1.9425	13 26 42.7	8.927	9	10 15 4.84	1.8460	5 29 13.9	10.706
10	8 46 25.66	1.9397	13 17 45.5	8.980	10	10 16 55.57	1.8450	5 18 30.9	10.727
11	8 48 21.96	1.9369	13 8 45.1	9.032	11	10 18 46.24	1.8439	5 7 46.7	10.746
12	8 50 18.09	1.9342	12 59 41.6	9.084	12	10 20 36.84	1.8429	4 57 1.4	10.764
13	8 52 14.06	1.9315	12 50 35.0	9.136	13	10 22 27.39	1.8420	4 46 15.0	10.783
14	8 54 9.87	1.9288	12 41 25.3	9.187	14	10 24 17.88	1.8411	4 35 27.4	10.802
15	8 56 5.52	1.9262	12 32 12.6	9.237	15	10 26 8.32	1.8403	4 24 38.7	10.820
16	8 58 1.01	1.9236	12 22 56.9	9.286	16	10 27 58.71	1.8395	4 13 49.0	10.836
17	8 59 56.35	1.9211	12 13 38.3	9.333	17	10 29 49.06	1.8387	4 2 58.4	10.852
18	9 1 51.54	1.9186	12 4 16.9	9.381	18	10 31 39.36	1.8380	3 52 6.8	10.867
19	9 3 46.58	1.9160	11 54 52.6	9.428	19	10 33 29.62	1.8373	3 41 14.3	10.882
20	9 5 41.46	1.9134	11 45 25.5	9.474	20	10 35 19.84	1.8367	3 30 21.0	10.896
21	9 7 36.19	1.9110	11 35 55.7	9.520	21	10 37 10.03	1.8362	3 19 26.8	10.909
22	9 9 30.78	1.9086	11 26 23.1	9.565	22	10 39 0.18	1.8357	3 8 31.9	10.922
23	9 11 25.22	1.9061	11 16 47.9	9.609	23	10 40 50.31	1.8352	2 57 36.2	10.934
24	9 13 19.51	1.9037	N.11 7 10.0	9.653	24	10 42 40.41	1.8347	N. 2 46 39.8	10.946

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 42 40.41	1.8347	N. 2 46 39.8	10.946
1	10 44 30.48	1.8343	2 35 42.7	10.957
2	10 46 20.53	1.8341	2 24 45.0	10.967
3	10 48 10.57	1.8338	2 13 46.7	10.976
4	10 50 0.59	1.8336	2 2 47.9	10.985
5	10 51 50.60	1.8334	1 51 48.5	10.994
6	10 53 40.59	1.8332	1 40 48.6	11.002
7	10 55 30.58	1.8331	1 29 48.3	11.008
8	10 57 20.56	1.8330	1 18 47.6	11.015
9	10 59 10.54	1.8330	1 7 46.5	11.021
10	11 1 0.52	1.8331	0 56 45.1	11.026
11	11 2 50.51	1.8332	0 45 43.4	11.031
12	11 4 40.50	1.8333	0 34 41.4	11.035
13	11 6 30.50	1.8335	0 23 39.2	11.038
14	11 8 20.52	1.8337	0 12 36.9	11.040
15	11 10 10.55	1.8340	N. 0 1 34.4	11.042
16	11 12 0.60	1.8344	S. 0 9 28.2	11.043
17	11 13 50.63	1.8348	0 20 30.8	11.043
18	11 15 40.78	1.8352	0 31 33.4	11.043
19	11 17 30.91	1.8357	0 42 36.0	11.043
20	11 19 21.07	1.8362	0 53 38.6	11.042
21	11 21 11.26	1.8368	1 4 41.1	11.041
22	11 23 1.49	1.8375	1 15 43.5	11.038
23	11 24 51.76	1.8383	S. 1 26 45.7	11.035

MONDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 26 42.08	1.8390	S. 1 37 47.7	11.032
1	11 28 32.44	1.8398	1 48 49.5	11.027
2	11 30 22.85	1.8406	1 59 50.9	11.021
3	11 32 13.31	1.8415	2 10 52.0	11.015
4	11 34 3.83	1.8425	2 21 52.7	11.009
5	11 35 54.41	1.8434	2 32 53.1	11.003
6	11 37 45.04	1.8444	2 43 53.1	10.996
7	11 39 35.74	1.8456	2 54 52.6	10.987
8	11 41 26.51	1.8467	3 5 51.5	10.977
9	11 43 17.35	1.8479	3 16 49.9	10.968
10	11 45 8.26	1.8492	3 27 47.7	10.958
11	11 46 59.25	1.8505	3 38 44.9	10.948
12	11 48 50.32	1.8518	3 49 41.4	10.936
13	11 50 41.47	1.8532	4 0 37.2	10.923
14	11 52 32.71	1.8547	4 11 32.2	10.911
15	11 54 24.04	1.8562	4 22 26.5	10.897
16	11 56 15.46	1.8578	4 33 19.9	10.883
17	11 58 6.98	1.8594	4 44 12.5	10.869
18	11 59 58.59	1.8611	4 55 4.2	10.853
19	12 1 50.31	1.8628	5 5 54.9	10.837
20	12 3 42.13	1.8646	5 16 44.6	10.820
21	12 5 34.06	1.8664	5 27 33.3	10.803
22	12 7 26.10	1.8683	5 38 21.0	10.785
23	12 9 18.25	1.8702	5 49 7.5	10.766
24	12 11 10.52	1.8722	S. 5 59 52.9	10.747

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 11 10.52	1.8722	S. 5 59 52.9	10.747
1	12 13 2.91	1.8742	6 10 37.1	10.727
2	12 14 55.43	1.8763	6 21 20.1	10.706
3	12 16 48.07	1.8784	6 32 1.8	10.684
4	12 18 40.84	1.8806	6 42 42.2	10.662
5	12 20 33.74	1.8829	6 53 21.3	10.640
6	12 22 26.78	1.8852	7 3 59.0	10.616
7	12 24 19.96	1.8875	7 14 35.2	10.592
8	12 26 13.28	1.8898	7 25 10.0	10.567
9	12 28 6.74	1.8922	7 35 43.3	10.542
10	12 30 0.35	1.8947	7 46 15.1	10.516
11	12 31 54.11	1.8973	7 56 45.2	10.489
12	12 33 48.03	1.8999	8 7 13.7	10.461
13	12 35 42.10	1.9026	8 17 40.5	10.432
14	12 37 36.34	1.9054	8 28 5.6	10.404
15	12 39 30.74	1.9080	8 38 29.0	10.375
16	12 41 25.30	1.9108	8 48 50.6	10.344
17	12 43 20.04	1.9137	8 59 10.3	10.312
18	12 45 14.95	1.9167	9 9 28.0	10.279
19	12 47 10.04	1.9197	9 19 43.8	10.247
20	12 49 5.31	1.9226	9 29 57.6	10.214
21	12 51 0.75	1.9256	9 40 9.5	10.181
22	12 52 56.38	1.9287	9 50 19.3	10.146
23	12 54 52.20	1.9319	S. 10 0 27.0	10.110

WEDNESDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 56 48.21	1.9352	S. 10 10 32.5	10.073
1	12 58 44.42	1.9384	10 20 35.8	10.037
2	13 0 40.82	1.9417	10 30 36.9	9.999
3	13 2 37.42	1.9450	10 40 35.7	9.960
4	13 4 34.22	1.9484	10 50 32.1	9.920
5	13 6 31.23	1.9519	11 0 26.1	9.881
6	13 8 28.45	1.9554	11 10 17.8	9.841
7	13 10 25.88	1.9589	11 20 7.0	9.799
8	13 12 23.52	1.9625	11 29 53.6	9.756
9	13 14 21.38	1.9662	11 39 37.7	9.713
10	13 16 19.46	1.9699	11 49 19.2	9.669
11	13 18 17.77	1.9737	11 58 58.0	9.624
12	13 20 16.30	1.9774	12 8 34.1	9.579
13	13 22 15.06	1.9812	12 18 7.5	9.532
14	13 24 14.05	1.9851	12 27 38.0	9.485
15	13 26 13.28	1.9891	12 37 5.7	9.437
16	13 28 12.74	1.9930	12 46 30.5	9.388
17	13 30 12.44	1.9971	12 55 52.3	9.339
18	13 32 12.39	2.0012	13 5 11.2	9.290
19	13 34 12.58	2.0052	13 14 27.1	9.238
20	13 36 13.02	2.0093	13 23 39.8	9.186
21	13 38 13.70	2.0135	13 32 49.4	9.133
22	13 40 14.64	2.0178	13 41 55.8	9.080
23	13 42 15.84	2.0221	13 50 59.0	9.025
24	13 44 17.29	2.0264	S. 13 59 58.8	8.969

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 44 17.29	2.0264	S. 13 59 58.8	8.969
1	13 46 19.00	2.0308	14 8 55.3	8.914
2	13 48 20.98	2.0352	14 17 48.5	8.857
3	13 50 23.22	2.0396	14 26 38.2	8.799
4	13 52 25.73	2.0441	14 35 24.4	8.740
5	13 54 28.51	2.0486	14 44 7.0	8.680
6	13 56 31.56	2.0532	14 52 46.0	8.619
7	13 58 34.89	2.0577	15 1 21.3	8.558
8	14 0 38.49	2.0623	15 9 53.0	8.496
9	14 2 42.37	2.0670	15 18 20.9	8.433
10	14 4 46.53	2.0717	15 26 45.0	8.369
11	14 6 50.98	2.0765	15 35 5.2	8.304
12	14 8 55.71	2.0813	15 43 21.5	8.238
13	14 11 0.73	2.0861	15 51 33.8	8.172
14	14 13 6.04	2.0908	15 59 42.1	8.104
15	14 15 11.63	2.0957	16 7 46.3	8.036
16	14 17 17.52	2.1007	16 15 46.4	7.967
17	14 19 23.71	2.1056	16 23 42.3	7.896
18	14 21 30.19	2.1105	16 31 33.9	7.824
19	14 23 36.97	2.1155	16 39 21.2	7.752
20	14 25 44.05	2.1206	16 47 4.1	7.679
21	14 27 51.44	2.1257	16 54 42.6	7.605
22	14 29 59.13	2.1307	17 2 16.7	7.531
23	14 32 7.12	2.1357	S. 17 9 46.3	7.455

FRIDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 34 15.41	2.1408	S. 17 17 11.3	7.378
1	14 36 24.01	2.1460	17 24 31.7	7.300
2	14 38 32.93	2.1512	17 31 47.3	7.220
3	14 40 42.16	2.1564	17 38 58.1	7.140
4	14 42 51.70	2.1616	17 46 4.1	7.060
5	14 45 1.55	2.1668	17 53 5.3	6.978
6	14 47 11.71	2.1720	18 0 1.5	6.895
7	14 49 22.19	2.1772	18 6 52.7	6.812
8	14 51 32.98	2.1825	18 13 38.9	6.727
9	14 53 44.09	2.1878	18 20 20.0	6 642
10	14 55 55.52	2.1931	18 26 55.9	6.555
11	14 58 7.27	2.1984	18 33 26.6	6.468
12	15 0 19.33	2.2037	18 39 52.1	6.380
13	15 2 31.71	2.2090	18 46 12.2	6.290
14	15 4 44.41	2.2144	18 52 26.9	6.199
15	15 6 57.44	2.2198	18 58 36.1	6.108
16	15 9 10.78	2.2251	19 4 39.8	6.016
17	15 11 24.45	2.2304	19 10 38.0	5.922
18	15 13 38.44	2.2358	19 16 30.5	5.827
19	15 15 52.75	2.2412	19 22 17.3	5.732
20	15 18 7.38	2.2465	19 27 58.3	5.636
21	15 20 22.33	2.2518	19 33 33.6	5.539
22	15 22 37.60	2.2572	19 39 3.0	5.440
23	15 24 53.19	2.2626	19 44 26.4	5.340
24	15 27 9.11	2.2680	S. 19 49 43.8	5.240

SATURDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 27 9.11	2.2680	S. 19 49 43.8	5.240
1	15 29 25.35	2.2733	19 54 55.2	5.139
2	15 31 41.90	2.2785	20 0 0.5	5.037
3	15 33 58.77	2.2838	20 4 59.6	4.933
4	15 36 15.96	2.2891	20 9 52.5	4.829
5	15 38 33.47	2.2944	20 14 39.1	4.723
6	15 40 51.29	2.2997	20 19 19.3	4.617
7	15 43 9.43	2.3049	20 23 53.1	4.510
8	15 45 27.88	2.3102	20 28 20.5	4.402
9	15 47 46.65	2.3154	20 32 41.4	4.293
10	15 50 5.73	2.3206	20 36 55.7	4.183
11	15 52 25.12	2.3257	20 41 3.4	4.072
12	15 54 44.82	2.3309	20 45 4.4	3.961
13	15 57 4.83	2.3361	20 48 58.7	3.848
14	15 59 25.15	2.3412	20 52 46.1	3.733
15	16 1 45.77	2.3462	20 56 26.6	3.618
16	16 4 6.70	2.3512	21 0 0.2	3.503
17	16 6 27.92	2.3562	21 3 26.9	3.386
18	16 8 49.44	2.3612	21 6 46.5	3.268
19	16 11 11.26	2.3661	21 9 59.0	3.149
20	16 13 33.37	2.3710	21 13 4.4	3.030
21	16 15 55.78	2.3759	21 16 2.6	2.909
22	16 18 18.48	2.3807	21 18 53.5	2.788
23	16 20 41.47	2.3855	S. 21 21 37.2	2.667

SUNDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 23 4.74	2.3903	S. 21 24 13.5	2.543
1	16 25 28.30	2.3950	21 26 42.4	2.419
2	16 27 52.14	2.3996	21 29 3.8	2.294
3	16 30 16.25	2.4041	21 31 17.7	2.169
4	16 32 40.63	2.4086	21 33 24.1	2.043
5	16 35 5.28	2.4131	21 35 22.9	1.916
6	16 37 30.20	2.4176	21 37 14.0	1.788
7	16 39 55.39	2.4220	21 38 57.4	1.659
8	16 42 20.84	2.4263	21 40 33.1	1.531
9	16 44 46.54	2.4305	21 42 1.1	1.401
10	16 47 12.50	2.4347	21 43 21.2	1.269
11	16 49 38.70	2.4388	21 44 33.3	1.136
12	16 52 5.15	2.4429	21 45 37.5	1.003
13	16 54 31.85	2.4469	21 46 33.7	0.870
14	16 56 58.78	2.4508	21 47 21.9	0.737
15	16 59 25.95	2.4547	21 48 2.1	0.603
16	17 1 53.35	2.4586	21 48 34.2	0.467
17	17 4 20.98	2.4623	21 48 58.1	0.331
18	17 6 48.83	2.4660	21 49 13.9	0.195
19	17 9 16.90	2.4696	21 49 21.5	−0.057
20	17 11 45.18	2.4732	21 49 20 8	+0.081
21	17 14 13.68	2.4767	21 49 11.8	0.219
22	17 16 42.38	2.4800	21 48 54.5	0.357
23	17 19 11.28	2.4833	21 48 28.9	0.497
24	17 21 40.37	2.4865	S. 21 47 54.9	0.637

GREENWICH MEAN TIME

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m
	MONDAY 13.					WEDNESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 21 40.37	2.4865	S. 21 47 54.9	0.637	0	19 23 7.39	2.5407	S. 18 31 49.4	7.497
1	17 24 9.66	2.4897	21 47 12.5	0.777	1	19 25 39.80	2.5397	18 24 15.5	7.632
2	17 26 39.14	2.4927	21 46 21.6	0.918	2	19 28 12.15	2.5387	18 16 33.6	7.765
3	17 29 8.79	2.4957	21 45 22.3	1.059	3	19 30 44.45	2.5377	18 8 43.7	7.898
4	17 31 38.62	2.4986	21 44 14.5	1.202	4	19 33 16.68	2.5366	18 0 45.8	8.031
5	17 34 8.62	2.5014	21 42 58.1	1.344	5	19 35 48.84	2.5354	17 52 39.9	8.163
6	17 36 38.79	2.5042	21 41 33.2	1.487	6	19 38 20.93	2.5342	17 44 26.2	8.293
7	17 39 9.12	2.5068	21 39 59.7	1.630	7	19 40 52.94	2.5328	17 36 4.7	8.423
8	17 41 39.61	2.5094	21 38 17.6	1.773	8	19 43 24.87	2.5314	17 27 35.4	8.552
9	17 44 10.25	2.5118	21 36 27.0	1.916	9	19 45 56.71	2.5300	17 18 58.4	8.680
10	17 46 41.03	2.5142	21 34 27.7	2.060	10	19 48 28.47	2.5285	17 10 13.8	8.807
11	17 49 11.96	2.5166	21 32 19.8	2.204	11	19 51 0.13	2.5269	17 1 21.6	8.933
12	17 51 43.03	2.5189	21 30 3.2	2.349	12	19 53 31.70	2.5253	16 52 21.9	9.058
13	17 54 14.23	2.5210	21 27 37.9	2.494	13	19 56 3.17	2.5237	16 43 14.7	9.181
14	17 56 45.55	2.5230	21 25 3.9	2.638	14	19 58 34.54	2.5219	16 34 0.2	9.303
15	17 59 16.99	2.5250	21 22 21.3	2.783	15	20 1 5.80	2.5202	16 24 38.4	9.424
16	18 1 48.55	2.5269	21 19 29.9	2.929	16	20 3 36.96	2.5184	16 15 9.3	9.544
17	18 4 20.22	2.5287	21 16 29.8	3.075	17	20 6 8.01	2.5165	16 5 33.1	9.663
18	18 6 51.99	2.5303	21 13 20.9	3.221	18	20 8 38.94	2.5145	15 55 49.8	9.781
19	18 9 23.86	2.5319	21 10 3.3	3.366	19	20 11 9.75	2.5126	15 45 59.4	9.898
20	18 11 55.82	2.5335	21 6 37.0	3.512	20	20 13 40.45	2.5107	15 36 2.1	10.013
21	18 14 27.88	2.5350	21 3 1.9	3.657	21	20 16 11.03	2.5087	15 25 57.9	10.127
22	18 17 0.02	2.5362	20 59 18.1	3.802	22	20 18 41.49	2.5066	15 15 46.9	10.239
23	18 19 32.23	2.5374	S. 20 55 25.6	3.948	23	20 21 11.82	2.5044	S. 15 5 29.2	10.350
	TUESDAY 14.					THURSDAY 16.			
0	18 22 4.51	2.5386	S. 20 51 24.3	4.094	0	20 23 42.02	2.5023	S. 14 55 4.9	10.460
1	18 24 36.86	2.5398	20 47 14.3	4.230	1	20 26 12.09	2.5001	14 44 34.0	10.569
2	18 27 9.28	2.5408	20 42 55.6	4.385	2	20 28 42.03	2.4978	14 33 56.6	10.677
3	18 29 41.75	2.5416	20 38 28.1	4.531	3	20 31 11.82	2.4955	14 23 12.8	10.783
4	18 32 14.27	2.5423	20 33 51.9	4.676	4	20 33 41.49	2.4933	14 12 22.7	10.887
5	18 34 46.83	2.5431	20 29 7.0	4.820	5	20 36 11.02	2.4910	14 1 26.4	10.990
6	18 37 19.44	2.5437	20 24 13.5	4.964	6	20 38 40.41	2.4886	13 50 23.9	11.092
7	18 39 52.08	2.5442	20 19 11.3	5.109	7	20 41 9.65	2.4862	13 39 15.4	11.192
8	18 42 24.75	2.5447	20 14 0.4	5.253	8	20 43 38.75	2.4838	13 28 0.9	11.291
9	18 44 57.45	2.5451	20 8 40.9	5.397	9	20 46 7.71	2.4814	13 16 40.5	11.388
10	18 47 30.16	2.5454	20 3 12.7	5.541	10	20 48 36.52	2.4790	13 5 14.4	11.483
11	18 50 2.89	2.5456	19 57 36.0	5.684	11	20 51 5.19	2.4766	12 53 42.6	11.577
12	18 52 35.63	2.5457	19 51 50.7	5.827	12	20 53 33.71	2.4741	12 42 5.2	11.669
13	18 55 8.37	2.5457	19 45 56.8	5.969	13	20 56 2.08	2.4716	12 30 22.3	11.760
14	18 57 41.11	2.5456	19 39 54.4	6.110	14	20 58 30.30	2.4690	12 18 34.0	11.849
15	19 0 13.84	2.5454	19 33 43.6	6.251	15	21 0 58.36	2.4665	12 6 40.4	11.937
16	19 2 46.56	2.5452	19 27 24.3	6.392	16	21 3 26.28	2.4641	11 54 41.6	12.023
17	19 5 19.27	2.5450	19 20 56.6	6.532	17	21 5 54.05	2.4615	11 42 37.7	12.108
18	19 7 51.96	2.5446	19 14 20.5	6.672	18	21 8 21.66	2.4589	11 30 28.7	12.192
19	19 10 24.62	2.5441	19 7 36.0	6.811	19	21 10 49.12	2.4564	11 18 14.8	12.272
20	19 12 57.25	2.5436	19 0 43.2	6.949	20	21 13 16.43	2.4539	11 5 56.1	12.350
21	19 15 29.85	2.5430	18 53 42.1	7.087	21	21 15 43.59	2.4513	10 53 32.8	12.427
22	19 18 2.41	2.5423	18 46 32.8	7.224	22	21 18 10.59	2.4487	10 41 4.9	12.503
23	19 20 34.92	2.5415	18 39 15.2	7.361	23	21 20 37.44	2.4462	10 28 32.4	12.578
24	19 23 7.39	2.5407	S. 18 31 49.4	7.497	24	21 23 4.13	2.4436	S. 10 15 55.5	12.651

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 17.					**SUNDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 23 4.13	2.4436	S. 10 15 55.5	12.651	0	23 17 41.85	2.3423	N. 0 40 47.1	14.017
1	21 25 30.67	2.4411	10 3 14.3	12.722	1	23 20 2.35	2.3410	0 54 47.7	14.002
2	21 27 57.06	2.4385	9 50 28.9	12.790	2	23 22 22.77	2.3396	1 8 47.3	13.984
3	21 30 23.29	2.4359	9 37 39.5	12.857	3	23 24 43.10	2.3383	1 22 45.8	13.966
4	21 32 49.37	2.4334	9 24 46.1	12.923	4	23 27 3.36	2.3370	1 36 43.2	13.946
5	21 35 15.30	2.4309	9 11 48.7	12.987	5	23 29 23.54	2.3358	1 50 39.3	13.923
6	21 37 41.08	2.4284	8 58 47.6	13.049	6	23 31 43.65	2.3346	2 4 34.0	13.900
7	21 40 6.71	2.4259	8 45 42.8	13.109	7	23 34 3.69	2.3334	2 18 27.3	13.875
8	21 42 32.19	2.4233	8 32 34.5	13.167	8	23 36 23.66	2.3323	2 32 19.0	13.848
9	21 44 57.51	2.4208	8 19 22.7	13.224	9	23 38 43.56	2.3312	2 46 9.0	13.819
10	21 47 22.68	2.4183	8 6 7.6	13.279	10	23 41 3.40	2.3302	2 59 57.3	13.789
11	21 49 47.71	2.4159	7 52 49.2	13.332	11	23 43 23.18	2.3291	3 13 43.7	13.757
12	21 52 12.59	2.4134	7 39 27.7	13.383	12	23 45 42.89	2.3281	3 27 28.2	13.724
13	21 54 37.32	2.4110	7 26 3.2	13.433	13	23 48 2.55	2.3272	3 41 10.6	13.689
14	21 57 1.91	2.4086	7 12 35.8	13.481	14	23 50 22.15	2.3262	3 54 50.9	13.652
15	21 59 26.35	2.4062	6 59 5.5	13.527	15	23 52 41.70	2.3253	4 8 28.9	13.614
16	22 1 50.65	2.4038	6 45 32.6	13.570	16	23 55 1.19	2.3245	4 22 4.6	13.575
17	22 4 14.81	2.4015	6 31 57.1	13.612	17	23 57 20.64	2.3237	4 35 37.9	13.533
18	22 6 38.83	2.3992	6 18 19.1	13.652	18	23 59 40.04	2.3229	4 49 8.6	13.490
19	22 9 2.71	2.3968	6 4 38.8	13.691	19	0 1 59.39	2.3222	5 2 36.7	13.447
20	22 11 26.45	2.3945	5 50 56.2	13.728	20	0 4 18.70	2.3215	5 16 2.2	13.402
21	22 13 50.05	2.3922	5 37 11.4	13.763	21	0 6 37.97	2.3208	5 29 24.9	13.354
22	22 16 13.52	2.3900	5 23 24.6	13.796	22	0 8 57.19	2.3201	5 42 44.7	13.306
23	22 18 36.85	2.3878	S. 5 9 35.9	13.827	23	0 11 16.38	2.3195	N. 5 56 1.6	13.256
	SATURDAY 18.					**MONDAY 20.**			
0	22 21 0.05	2.3856	S. 4 55 45.4	13.856	0	0 13 35.53	2.3189	N. 6 9 15.4	13.204
1	22 23 23.12	2.3834	4 41 53.2	13.883	1	0 15 54.65	2.3183	6 22 26.1	13.152
2	22 25 46.06	2.3813	4 27 59.4	13.909	2	0 18 13.73	2.3177	6 35 33.6	13.097
3	22 28 8.87	2.3792	4 14 4.1	13.933	3	0 20 32.78	2.3172	6 48 37.8	13.042
4	22 30 31.56	2.3772	4 0 7.4	13.955	4	0 22 51.80	2.3168	7 1 38.7	12.985
5	22 32 54.13	2.3751	3 46 9.5	13.975	5	0 25 10.80	2.3164	7 14 36.0	12.925
6	22 35 16.57	2.3730	3 32 10.4	13.993	6	0 27 29.77	2.3160	7 27 29.7	12.865
7	22 37 38.89	2.3710	3 18 10.3	14.010	7	0 29 48.72	2.3157	7 40 19.8	12.805
8	22 40 1.09	2.3691	3 4 9.2	14.025	8	0 32 7.65	2.3153	7 53 6.3	12.743
9	22 42 23.18	2.3672	2 50 7.3	14.037	9	0 34 26.55	2.3149	8 5 49.0	12.679
10	22 44 45.15	2.3653	2 36 4.7	14.048	10	0 36 45.43	2.3146	8 18 27.8	12.614
11	22 47 7.01	2.3634	2 22 1.5	14.057	11	0 39 4.30	2.3143	8 31 2.7	12.547
12	22 49 28.76	2.3616	2 7 57.8	14.065	12	0 41 23.15	2.3141	8 43 33.5	12.479
13	22 51 50.40	2.3598	1 53 53.7	14.071	13	0 43 41.99	2.3138	8 56 0.2	12.411
14	22 54 11.93	2.3580	1 39 49.3	14.075	14	0 46 0.81	2.3136	9 8 22.8	12.343
15	22 56 33.36	2.3563	1 25 44.7	14.077	15	0 48 19.62	2.3134	9 20 41.2	12.271
16	22 58 54.68	2.3546	1 11 40.0	14.077	16	0 50 38.42	2.3133	9 32 55.3	12.198
17	23 1 15.91	2.3530	0 57 35.4	14.076	17	0 52 57.21	2.3132	9 45 5.0	12.124
18	23 3 37.04	2.3513	0 43 30.9	14.072	18	0 55 16.00	2.3131	9 57 10.2	12.049
19	23 5 58.07	2.3497	0 29 26.7	14.067	19	0 57 34.78	2.3129	10 9 10.9	11.973
20	23 8 19.01	2.3482	0 15 22.8	14.061	20	0 59 53.55	2.3128	10 21 7.0	11.897
21	23 10 39.85	2.3466	S. 0 1 19.4	14.052	21	1 2 12.32	2.3127	10 32 58.5	11.819
22	23 13 0.60	2.3452	N. 0 12 43.5	14.042	22	1 4 31.08	2.3127	10 44 45.3	11.739
23	23 15 21.27	2.3437	0 26 45.7	14.030	23	1 6 49.84	2.3127	10 56 27.2	11.658
24	23 17 41.85	2.3423	N. 0 40 47.1	14.017	24	1 9 8.60	2.3127	N. 11 8 4.3	11.577

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 21.					THURSDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 9 8.60	2.3127	N.11 8 4.3	11.577	0	3 0 14.70	2.3146	N.18 33 2.8	6.697
1	1 11 27.36	2.3127	11 19 36.5	11.495	1	3 2 33.57	2.3143	18 39 41.2	6.582
2	1 13 46.12	2.3127	11 31 3.7	11.411	2	3 4 52.42	2.3141	18 46 12.6	6.466
3	1 16 4.88	2.3127	11 42 25.8	11.326	3	3 7 11.26	2.3138	18 52 37.1	6.350
4	1 18 23.65	2.3128	11 53 42.8	11.240	4	3 9 30.08	2.3134	18 58 54.6	6.233
5	1 20 42.42	2.3128	12 4 54.6	11.153	5	3 11 48.87	2.3130	19 5 5.1	6.117
6	1 23 1.19	2.3129	12 16 1.2	11.066	6	3 14 7.64	2.3127	19 11 8.6	6.000
7	1 25 19.97	2.3130	12 27 2.5	10.977	7	3 16 26.39	2.3123	19 17 5.1	5.883
8	1 27 38.75	2.3131	12 37 58.4	10.887	8	3 18 45.11	2.3119	19 22 54.5	5.765
9	1 29 57.54	2.3132	12 48 49.0	10.797	9	3 21 3.81	2.3114	19 28 36.9	5.647
10	1 32 16.33	2.3133	12 59 34.1	10.706	10	3 23 22.48	2.3108	19 34 12.2	5.529
11	1 34 35.13	2.3134	13 10 13.7	10.613	11	3 25 41.11	2.3102	19 39 40.4	5.411
12	1 36 53.94	2.3136	13 20 47.7	10.520	12	3 27 59.70	2.3096	19 45 1.5	5.292
13	1 39 12.76	2.3137	13 31 16.1	10.426	13	3 30 18.26	2.3090	19 50 15.5	5.174
14	1 41 31.58	2.3138	13 41 38.8	10.331	14	3 32 36.78	2.3084	19 55 22.4	5.056
15	1 43 50.41	2.3139	13 51 55.8	10.235	15	3 34 55.27	2.3078	20 0 22.2	4.937
16	1 46 9.25	2.3140	14 2 7.0	10.138	16	3 37 13.72	2.3071	20 5 14.9	4.818
17	1 48 28.09	2.3141	14 12 12.4	10.041	17	3 39 32.12	2.3063	20 10 0.4	4.699
18	1 50 46.94	2.3142	14 22 11.9	9.942	18	3 41 50.47	2.3055	20 14 38.8	4.580
19	1 53 5.80	2.3144	14 32 5.5	9.843	19	3 44 8.78	2.3047	20 19 10.0	4.461
20	1 55 24.67	2.3146	14 41 53.1	9.743	20	3 46 27.04	2.3038	20 23 34.1	4.342
21	1 57 43.55	2.3147	14 51 34.7	9.642	21	3 48 45.24	2.3029	20 27 51.1	4.223
22	2 0 2.44	2.3149	15 1 10.2	9.541	22	3 51 3.39	2.3020	20 32 0.9	4.103
23	2 2 21.34	2.3150	N.15 10 39.6	9.439	23	3 53 21.48	2.3011	N.20 36 3.5	3.984
	WEDNESDAY 22.					FRIDAY 24.			
0	2 4 40.24	2.3151	N.15 20 2.9	9.337	0	3 55 39.52	2.3002	N.20 39 59.0	3.865
1	2 6 59.15	2.3152	15 29 20.0	9.233	1	3 57 57.50	2.2991	20 43 47.3	3.745
2	2 9 18.07	2.3153	15 38 30.9	9.129	2	4 0 15.41	2.2979	20 47 28.4	3.626
3	2 11 36.99	2.3154	15 47 35.5	9.024	3	4 2 33.25	2.2968	20 51 2.4	3.507
4	2 13 55.92	2.3155	15 56 33.8	8.918	4	4 4 51.03	2.2957	20 54 29.2	3.387
5	2 16 14.85	2.3156	16 5 25.7	8.813	5	4 7 8.74	2.2945	20 57 48.9	3.268
6	2 18 33.79	2.3157	16 14 11.3	8.707	6	4 9 26.37	2.2932	21 1 1.4	3.149
7	2 20 52.74	2.3158	16 22 50.5	8.599	7	4 11 43.93	2.2920	21 4 6.8	3.030
8	2 23 11.69	2.3158	16 31 23.2	8.491	8	4 14 1.41	2.2907	21 7 5.0	2.911
9	2 25 30.64	2.3158	16 39 49.4	8.382	9	4 16 18.82	2.2894	21 9 56.1	2.792
10	2 27 49.59	2.3159	16 48 9.1	8.273	10	4 18 36.14	2.2880	21 12 40.0	2.673
11	2 30 8.55	2.3160	16 56 22.2	8.163	11	4 20 53.38	2.2866	21 15 16.8	2.554
12	2 32 27.51	2.3160	17 4 28.7	8.053	12	4 23 10.53	2.2851	21 17 46.5	2.436
13	2 34 46.47	2.3160	17 12 28.6	7.943	13	4 25 27.59	2.2836	21 20 9.1	2.317
14	2 37 5.43	2.3159	17 20 21.9	7.833	14	4 27 44.56	2.2821	21 22 24.6	2.198
15	2 39 24.38	2.3158	17 28 8.5	7.721	15	4 30 1.44	2.2805	21 24 32.9	2.080
16	2 41 43.33	2.3158	17 35 48.4	7.609	16	4 32 18.22	2.2788	21 26 34.2	1.962
17	2 44 2.28	2.3157	17 43 21.5	7.496	17	4 34 34.90	2.2772	21 28 28.4	1.845
18	2 46 21.22	2.3157	17 50 47.9	7.383	18	4 36 51.49	2.2756	21 30 15.6	1.727
19	2 48 40.16	2.3156	17 58 7.5	7.270	19	4 39 7.97	2.2738	21 31 55.7	1.609
20	2 50 59.09	2.3154	18 5 20.3	7.156	20	4 41 24.34	2.2720	21 33 28.7	1.492
21	2 53 18.01	2.3153	18 12 26.2	7.042	21	4 43 40.61	2.2702	21 34 54.7	1.375
22	2 55 36.92	2.3151	18 19 25.3	6.927	22	4 45 56.77	2.2683	21 36 13.7	1.258
23	2 57 55.82	2.3148	18 26 17.5	6.812	23	4 48 12.81	2.2664	21 37 25.7	1.142
24	3 0 14.70	2.3146	N.18 33 2.8	6.697	24	4 50 28.74	2.2645	N.21 38 30.8	1.027

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	4 50 28.74	2.2645	N.21 38 30.8	1.027
1	4 52 44.55	2.2625	21 39 28.9	0.910
2	4 55 0.24	2.2605	21 40 20.0	0.794
3	4 57 15.81	2.2585	21 41 4.2	0.678
4	4 59 31.26	2.2564	21 41 41.4	0.563
5	5 1 46.58	2.2542	21 42 11.8	0.449
6	5 4 1.77	2.2521	21 42 35.3	0.334
7	5 6 16.83	2.2499	21 42 51.9	0.220
8	5 8 31.76	2.2477	21 43 1.7	+ 0.107
9	5 10 46.55	2.2453	21 43 4.7	− 0.007
10	5 13 1.20	2.2430	21 43 0.9	0.120
11	5 15 15.71	2.2407	21 42 50.3	0.233
12	5 17 30.09	2.2384	21 42 32.9	0.346
13	5 19 44.32	2.2359	21 42 8.8	0.458
14	5 21 58.40	2.2335	21 41 38.0	0.569
15	5 24 12.34	2.2311	21 41 0.5	0.681
16	5 26 26.13	2.2285	21 40 16.3	0.792
17	5 28 39.76	2.2259	21 39 25.5	0.902
18	5 30 53.24	2.2233	21 38 28.1	1.012
19	5 33 6.56	2.2206	21 37 24.1	1.121
20	5 35 19.73	2.2180	21 36 13.6	1.230
21	5 37 32.74	2.2155	21 34 56.5	1.339
22	5 39 45.59	2.2128	21 33 32.9	1.448
23	5 41 58.28	2.2101	N.21 32 2.8	1.556

SUNDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	5 44 10.80	2.2073	N.21 30 26.2	1.663
1	5 46 23.15	2.2045	21 28 43.2	1.770
2	5 48 35.34	2.2017	21 26 53.8	1.877
3	5 50 47.36	2.1989	21 24 58.0	1.982
4	5 52 59.21	2.1960	21 22 55.9	2.087
5	5 55 10.88	2.1931	21 20 47.5	2.192
6	5 57 22.38	2.1902	21 18 32.8	2.297
7	5 59 33.70	2.1872	21 16 11.9	2.401
8	6 1 44.85	2.1843	21 13 44.7	2.505
9	6 3 55.82	2.1813	21 11 11.3	2.608
10	6 6 6.61	2.1783	21 8 31.8	2.710
11	6 8 17.22	2.1752	21 5 46.1	2.812
12	6 10 27.64	2.1722	21 2 54.3	2.913
13	6 12 37.88	2.1692	20 59 56.5	3.014
14	6 14 47.94	2.1661	20 56 52.6	3.115
15	6 16 57.81	2.1629	20 53 42.7	3.214
16	6 19 7.49	2.1598	20 50 26.9	3.313
17	6 21 16.98	2.1567	20 47 5.2	3.412
18	6 23 26.29	2.1536	20 43 37.5	3.511
19	6 25 35.41	2.1504	20 40 3.9	3.608
20	6 27 44.33	2.1471	20 36 24.5	3.704
21	6 29 53.06	2.1439	20 32 39.4	3.800
22	6 32 1.60	2.1407	20 28 48.5	3.896
23	6 34 9.95	2.1375	20 24 51.9	3.992
24	6 36 18.10	2.1342	N.20 20 49.5	4.087

MONDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	6 36 18.10	2.1342	N.20 20 49.5	4.087
1	6 38 26.05	2.1309	20 16 41.5	4.180
2	6 40 33.81	2.1277	20 12 27.9	4.273
3	6 42 41.38	2.1245	20 8 8.7	4.366
4	6 44 48.75	2.1212	20 3 43.9	4.459
5	6 46 55.92	2.1178	19 59 13.6	4.551
6	6 49 2.89	2.1145	19 54 37.8	4.642
7	6 51 9.66	2.1112	19 49 56.5	4.732
8	6 53 16.23	2.1079	19 45 9.9	4.822
9	6 55 22.61	2.1046	19 40 17.9	4.911
10	6 57 28.79	2.1013	19 35 20.6	4.999
11	6 59 34.77	2.0980	19 30 18.0	5.087
12	7 1 40.55	2.0947	19 25 10.1	5.175
13	7 3 46.13	2.0913	19 19 57.0	5.262
14	7 5 51.51	2.0880	19 14 38.7	5.348
15	7 7 56.69	2.0847	19 9 15.3	5.433
16	7 10 1.67	2.0813	19 3 46.8	5.518
17	7 12 6.45	2.0779	18 58 13.2	5.603
18	7 14 11.02	2.0745	18 52 34.5	5.687
19	7 16 15.39	2.0712	18 46 50.8	5.769
20	7 18 19.57	2.0680	18 41 2.2	5.851
21	7 20 23.55	2.0647	18 35 8.7	5.932
22	7 22 27.33	2.0613	18 29 10.3	6.013
23	7 24 30.91	2.0580	N.18 23 7.1	6.093

TUESDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	7 26 34.29	2.0547	N.18 16 59.1	6.173
1	7 28 37.47	2.0514	18 10 46.3	6.252
2	7 30 40.45	2.0481	18 4 28.8	6.331
3	7 32 43.24	2.0448	17 58 6.6	6.409
4	7 34 45.83	2.0415	17 51 39.7	6.486
5	7 36 48.22	2.0382	17 45 8.3	6.562
6	7 38 50.42	2.0350	17 38 32.3	6.638
7	7 40 52.42	2.0317	17 31 51.7	6.713
8	7 42 54.23	2.0285	17 25 6.7	6.788
9	7 44 55.84	2.0253	17 18 17.2	6.861
10	7 46 57.26	2.0221	17 11 23.3	6.934
11	7 48 58.49	2.0189	17 4 25.1	7.007
12	7 50 59.53	2.0157	16 57 22.5	7.079
13	7 53 0.37	2.0125	16 50 15.6	7.150
14	7 55 1.03	2.0094	16 43 4.5	7.220
15	7 57 1.50	2.0062	16 35 49.2	7.290
16	7 59 1.78	2.0031	16 28 29.7	7.360
17	8 1 1.87	1.9999	16 21 6.0	7.429
18	8 3 1.77	1.9968	16 13 38.2	7.496
19	8 5 1.49	1.9937	16 6 6.4	7.563
20	8 7 1.02	1.9907	15 58 30.6	7.630
21	8 9 0.37	1.9877	15 50 50.8	7.697
22	8 10 59.54	1.9847	15 43 7.0	7.762
23	8 12 58.53	1.9817	15 35 19.3	7.827
24	8 14 57.34	1.9787	N.15 27 27.8	7.890

GREENWICH MEAN TIME.

PHASES OF THE MOON.

	d	h	m
○ **Full Moon**	2	17	58.0
☾ **Last Quarter**	10	20	34.1
● **New Moon**	17	14	49.9
☽ **First Quarter**	24	9	30.8

	d	h
☾ **Apogee**	3	23.0
☾ **Perigee**	17	13.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Arietis	W.	78° 19′ 57″	3055	79° 49′ 2″	3058	81° 18′ 3″	3061	82° 47′ 0″	3065
	SATURN	W.	77 12 46	3051	78 41 56	3055	80 11 1	3059	81 40 1	3062
	JUPITER	W.	66 26 26	3049	67 55 38	3053	69 24 45	3057	70 53 47	3061
	Aldebaran	W.	45 13 8	3054	46 42 14	3056	48 11 17	3059	49 40 17	3061
	MARS	W.	27 26 54	3095	28 55 10	3092	30 23 29	3091	31 51 50	3089
	Regulus	E.	34 56 18	3080	33 27 44	3089	31 59 21	3100	30 31 11	3110
	Spica	E.	88 35 26	3018	87 5 36	3023	85 35 52	3027	84 6 13	3030
2	SATURN	W.	89 3 58	3078	90 32 34	3082	92 1 6	2084	93 29 35	3087
	JUPITER	W.	78 17 49	3078	79 46 26	3081	81 14 59	3083	82 43 29	3087
	Aldebaran	W.	57 4 37	3072	58 33 21	3074	60 2 2	3076	61 30 41	3078
	MARS	W.	39 13 46	3090	40 42 8	3090	42 10 30	3091	43 38 50	3092
	Spica	E.	76 39 2	3047	75 9 47	3050	73 40 36	3052	72 11 28	3056
3	SATURN	W.	100 51 11	3098	102 19 23	3101	103 47 32	3102	105 15 39	3104
	JUPITER	W.	90 5 11	3097	91 33 24	3100	93 1 34	3101	94 29 43	3102
	Aldebaran	W.	68 53 26	3086	70 21 53	3087	71 50 19	3087	73 18 44	3089
	MARS	W.	51 0 11	3098	52 28 23	3099	53 56 34	3100	55 24 44	3101
	Pollux	W.	28 7 38	3380	29 30 17	3354	30 53 26	3332	32 17 0	3313
	Spica	E.	64 46 35	3066	63 17 44	3068	61 48 55	3069	60 20 7	3070
	Antares	E.	110 13 31	3081	108 44 58	3082	107 16 26	3083	105 47 56	3084
4	JUPITER	W.	101 50 3	3107	103 18 4	3108	104 46 4	3108	106 14 4	3109
	Aldebaran	W.	80 40 32	3091	82 8 52	3092	83 37 11	3092	85 5 30	3091
	MARS	W.	62 45 17	3105	64 13 21	3105	65 41 25	3105	67 9 29	3105
	Pollux	W.	39 19 41	3245	40 44 57	3235	42 10 25	3226	43 36 3	3218
	Spica	E.	52 56 31	3075	51 27 51	3076	49 59 12	3076	48 30 33	3075
	Antares	E.	98 25 41	3087	96 57 16	3088	95 28 52	3088	94 0 28	3087
5	Aldebaran	W.	92 27 15	3088	93 55 39	3087	95 24 4	3086	96 52 31	3083
	MARS	W.	74 29 52	3102	75 57 59	3101	77 26 7	3101	78 54 16	3099
	Pollux	W.	50 46 25	3184	52 12 53	3179	53 39 27	3173	55 6 8	3168
	Spica	E.	41 7 11	3073	39 38 29	3072	38 9 45	3070	36 40 59	3069
	Antares	E.	86 38 20	3085	85 9 52	3083	83 41 22	3082	82 12 50	3080
6	Aldebaran	W.	104 15 24	3072	105 44 8	3069	107 12 55	3066	108 41 46	3063
	MARS	W.	86 15 34	3088	87 43 58	3086	89 12 25	3082	90 40 56	3079
	Pollux	W.	62 21 9	3141	63 48 29	3136	65 15 55	3130	66 43 28	3124
	Regulus	W.	25 19 29	3157	26 46 30	3143	28 13 48	3131	29 41 20	3119
	Spica	E.	29 16 40	3059	27 47 40	3056	26 18 37	3053	24 49 30	3050
	Antares	E.	74 49 36	3069	73 20 48	3066	71 51 57	3063	70 23 2	3059
7	MARS	W.	98 4 39	3059	99 33 39	3053	101 2 46	3048	102 31 59	3043
	Pollux	W.	74 3 1	3194	75 31 18	3087	76 59 43	3080	78 28 17	3073
	Regulus	W.	37 2 11	3072	38 30 55	3062	39 59 51	3053	41 28 58	3041
	Antares	E.	62 57 13	3038	61 27 47	3032	59 58 14	3027	58 28 35	3022
	α Aquilæ	E.	114 1 26	3545	112 41 51	3526	111 21 56	3510	110 1 43	3494
	SUN	E.	133 33 9	3431	132 11 27	3423	130 49 37	3416	129 27 39	3408
8	Pollux	W.	85 53 20	3034	87 22 50	3026	88 52 31	3018	90 22 22	3008
	Regulus	W.	48 57 21	2997	50 27 37	2988	51 58 5	2978	53 28 45	2968
	Antares	E.	50 58 28	2989	49 28 2	2982	47 57 27	2974	46 26 42	2967
	α Aquilæ	E.	103 16 21	3422	101 54 29	3408	100 32 21	3394	99 9 58	3381

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
1	α Arietis	W.	84° 15′ 52″	3069	85° 44′ 39″	3073	87° 13′ 22″	3075	88° 42′ 2″	3078
	Saturn	W.	83 8 57	3065	84 37 49	3069	86 6 36	3073	87 35 19	3076
	Jupiter	W.	72 22 44	3065	73 51 37	3069	75 20 25	3072	76 49 9	3075
	Aldebaran	W.	51 9 14	3063	52 38 9	3065	54 7 1	3068	55 35 50	3069
	Mars	W.	33 20 13	3088	34 48 37	3088	36 17 1	3089	37 45 24	3090
	Regulus	E.	29 3 13	3121	27 35 29	3134	26 8 1	3148	24 40 50	3164
	Spica	E.	82 36 38	3034	81 7 8	3038	79 37 42	3041	78 8 20	3044
2	Saturn	W.	94 58 0	3090	96 26 22	3092	97 54 41	3095	99 22 57	3096
	Jupiter	W.	84 11 55	3089	85 40 18	3091	87 8 38	3093	88 36 56	3096
	Aldebaran	W.	62 59 18	3079	64 27 53	3081	65 56 26	3082	67 24 57	3084
	Mars	W.	45 7 9	3093	46 35 27	3095	48 3 43	3096	49 31 58	3097
	Spica	E.	70 42 24	3058	69 13 23	3060	67 44 24	3062	66 15 28	3065
3	Saturn	W.	106 43 44	3105	108 11 47	3106	109 39 49	3108	111 7 49	3109
	Jupiter	W.	95 57 50	3104	97 25 55	3105	98 53 59	3106	100 22 1	3106
	Aldebaran	W.	74 47 7	3090	76 15 29	3090	77 43 51	3091	79 12 12	3091
	Mars	W.	56 52 52	3102	58 20 59	3102	59 49 6	3103	61 17 12	3104
	Pollux	W.	33 40 57	3295	35 5 14	3281	36 29 48	3267	37 54 38	3256
	Spica	E.	58 51 21	3072	57 22 37	3073	55 53 54	3073	54 25 12	3074
	Antares	E.	104 19 27	3085	102 50 59	3086	101 22 32	3087	99 54 6	3087
4	Jupiter	W.	107 42 3	3108	109 10 3	3108	110 38 3	3107	112 6 4	3107
	Aldebaran	W.	86 33 50	3091	88 2 10	3091	89 30 31	3090	90 58 53	3090
	Mars	W.	68 37 33	3105	70 5 37	3105	71 33 41	3104	73 1 46	3103
	Pollux	W.	45 1 51	3211	46 27 47	3204	47 53 52	3197	49 20 5	3191
	Spica	E.	47 1 53	3075	45 33 13	3075	44 4 33	3074	42 35 52	3074
	Antares	E.	92 32 3	3087	91 3 38	3087	89 35 13	3087	88 6 47	3086
5	Aldebaran	W.	98 21 1	3082	99 49 33	3080	101 18 7	3078	102 46 44	3075
	Mars	W.	80 22 27	3097	81 50 40	3096	83 18 55	3093	84 47 13	3091
	Pollux	W.	56 32 55	3163	57 59 49	3158	59 26 49	3152	60 53 56	3147
	Spica	E.	35 12 12	3068	33 43 23	3065	32 14 31	3064	30 45 37	3061
	Antares	E.	80 44 16	3078	79 15 40	3077	77 47 2	3074	76 18 21	3071
6	Aldebaran	W.	110 10 41	3059	111 39 41	3055	113 8 46	3051	114 37 56	3047
	Mars	W.	92 9 31	3075	93 38 11	3072	95 6 55	3068	96 35 44	3063
	Pollux	W.	68 11 8	3119	69 38 55	3112	71 6 50	3106	72 34 52	3101
	Regulus	W.	31 9 6	3109	32 37 5	3099	34 5 16	3090	35 33 38	3081
	Spica	E.	23 20 19	3047	21 51 4	3043	20 21 45	3041	18 52 23	3038
	Antares	E.	68 54 2	3055	67 24 57	3052	65 55 48	3047	64 26 33	3043
7	Mars	W.	104 1 19	3037	105 30 46	3030	107 0 21	3024	108 30 4	3017
	Pollux	W.	79 56 59	3066	81 25 50	3059	82 54 50	3051	84 24 0	3043
	Regulus	W.	42 58 16	3035	44 27 45	3026	45 57 25	3017	47 27 17	3007
	Antares	E.	56 58 49	3016	55 28 56	3009	53 58 55	3003	52 28 46	2996
	α Aquilæ	E.	108 41 12	3479	107 20 24	3463	105 59 19	3449	104 37 58	3435
	Sun	E.	128 5 32	3400	126 43 15	3392	125 20 49	3383	123 58 13	3374
8	Pollux	W.	91 52 25	2999	93 22 39	2989	94 53 6	2979	96 23 45	2969
	Regulus	W.	54 59 38	2957	56 30 45	2946	58 2 5	2935	59 33 39	2924
	Antares	E.	44 55 48	2959	43 24 44	2952	41 53 31	2943	40 22 7	2935
	α Aquilæ	E.	97 47 20	3369	96 24 28	3356	95 1 21	3344	93 38 0	3332

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
8	Sun	E.	122° 35′ 27″	3365	121° 12′ 30″	3355	119° 49′ 22″	3345	118° 26′ 2″	3334
9	Pollux	W.	97 54 36	2959	99 25 40	2948	100 56 58	2938	102 28 29	2926
	Regulus	W.	61 5 27	2912	62 37 30	2900	64 9 49	2888	65 42 23	2875
	Antares	E.	38 50 32	2927	37 18 47	2918	35 46 51	2909	34 14 44	2901
	α Aquilæ	E.	92 14 26	3320	90 50 38	3308	89 26 36	3297	88 2 21	3285
	Sun	E.	111 26 15	3276	110 1 36	3265	108 36 43	3252	107 11 35	3238
10	Regulus	W.	73 29 26	2808	75 3 44	2794	76 38 20	2779	78 13 16	2763
	Spica	W.	19 26 47	2798	21 1 18	2782	22 36 9	2766	24 11 21	5750
	Antares	E.	26 31 44	2868	24 58 44	2863	23 25 38	2861	21 52 29	2862
	α Aquilæ	E.	80 57 53	3233	79 32 23	3224	78 6 42	3214	76 40 50	3206
	Sun	E.	100 1 48	3166	98 34 58	3151	97 7 50	3134	95 40 22	3119
11	Regulus	W.	86 13 2	2684	87 50 3	2667	89 27 27	2651	91 5 13	2633
	Spica	W.	32 12 42	2669	33 50 4	2652	35 27 49	2635	37 5 57	2618
	α Aquilæ	E.	69 29 6	3170	68 2 21	3166	66 35 31	3162	65 8 36	3159
	Sun	E.	88 18 3	3033	86 48 31	3015	85 18 37	2997	83 48 20	2979
12	Regulus	W.	99 19 59	2545	101 0 9	2527	102 40 45	2510	104 21 45	2491
	Spica	W.	45 22 38	2527	47 3 13	2510	48 44 13	2491	50 25 39	2472
	α Aquilæ	E.	57 53 43	3167	56 26 51	3174	55 0 14	3184	53 33 46	3197
	Sun	E.	76 11 6	2883	74 38 26	2864	73 5 21	2845	71 31 51	2825
13	Spica	W.	58 59 26	2378	60 43 32	2360	62 28 4	2342	64 13 3	2323
	α Aquilæ	E.	46 26 39	3320	45 2 51	3361	43 39 50	3410	42 17 45	3467
	Sun	E.	63 37 58	2727	62 1 54	2707	60 25 24	2688	58 48 28	2669
14	Spica	W.	73 4 39	2233	74 52 17	2216	76 40 21	2199	78 28 50	2182
	Antares	W.	27 55 27	2297	29 41 31	2273	31 28 10	2251	33 15 22	2229
	Sun	E.	50 37 30	2578	48 58 5	2561	47 18 16	2544	45 38 4	2528
15	Spica	W.	87 37 24	2105	89 28 15	2091	91 19 28	2077	93 11 2	2064
	Antares	W.	42 18 55	2136	44 8 59	2120	45 59 28	2105	47 50 20	2090
	Sun	E.	37 11 50	2460	35 29 40	2448	33 47 14	2438	32 4 34	2431
19	Sun	W.	20 19 4	2439	22 1 43	2431	23 44 33	2428	25 27 28	2438
	Saturn	E.	47 11 52	2056	45 19 45	2068	43 27 56	2080	41 36 26	2093
	Jupiter	E.	58 29 12	2048	56 36 53	2059	54 44 50	2070	52 53 4	2081
	Aldebaran	E.	78 10 12	2027	76 17 20	2037	74 24 43	2048	72 32 23	2059
	Mars	E.	97 43 38	2080	95 52 8	2090	94 0 54	2101	92 9 57	2113
	Pollux	E.	120 2 52	2101	118 11 55	2109	116 21 9	2116	114 30 34	2124
20	Sun	W.	34 0 48	2463	35 42 53	2475	37 24 41	2487	39 6 12	2501
	Saturn	E.	32 24 35	2176	30 35 32	2197	28 47 0	2219	26 59 1	2243
	Jupiter	E.	43 38 56	2148	41 49 10	2163	39 59 47	2179	38 10 48	2196
	Aldebaran	E.	63 15 31	2127	61 25 13	2142	59 35 18	2158	57 45 47	2174
	Mars	E.	82 59 55	2180	81 10 58	2196	79 22 24	2211	77 34 13	2228
	Pollux	E.	105 21 22	2180	103 32 25	2194	101 43 48	2208	99 55 32	2223
21	Sun	W.	47 28 41	2580	49 8 4	2598	50 47 2	2615	52 25 36	2634
	Aldebaran	E.	48 44 41	2264	46 57 49	2284	45 11 26	2304	43 25 33	2325

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
8	Sun	E.	117° 2′ 30″	3324	115° 38′ 46″	3313	114° 14′ 49″	3301	112° 50′ 39″	3289
9	Pollux	W.	104 0 15	2915	105 32 15	2903	107 4 30	2891	108 37 0	2880
	Regulus	W.	67 15 14	2862	68 48 21	2849	70 21 45	2835	71 55 27	2822
	Antares	E.	32 42 27	2894	31 10 0	2896	29 37 23	2879	28 4 37	2873
	α Aquilæ	E.	86 37 52	3275	85 13 11	3264	83 48 17	3253	82 23 11	3243
	Sun	E.	105 46 11	3225	104 20 31	3210	102 54 34	3196	101 28 20	3181
10	Regulus	W.	79 48 32	2748	81 24 8	2732	83 0 5	2716	84 36 23	2701
	Spica	W.	25 46 55	2734	27 22 50	2718	28 59 6	2702	30 35 43	2686
	Antares	E.	20 19 21	2865	18 46 17	2873	17 13 24	2892	15 40 55	2924
	α Aquilæ	E.	75 14 48	3198	73 48 36	3189	72 22 14	3183	70 55 44	3176
	Sun	E.	94 12 35	3102	92 44 28	3086	91 16 1	3069	89 47 13	3051
11	Regulus	W.	92 43 23	2616	94 21 56	2599	96 0 53	2581	97 40 14	2564
	Spica	W.	38 44 28	2600	40 23 23	2582	42 2 43	2564	43 42 28	2545
	α Aquilæ	E.	63 41 38	3158	62 14 38	3157	60 47 37	3158	59 20 38	3162
	Sun	E.	82 17 41	2961	80 46 39	2942	79 15 13	2922	77 43 22	2902
12	Regulus	W.	106 3 11	2473	107 45 2	2455	109 27 19	2437	111 10 1	2419
	Spica	W.	52 7 32	2453	53 49 51	2435	55 32 36	2416	57 15 48	2398
	α Aquilæ	E.	52 7 33	3213	50 41 39	3233	49 16 9	3257	47 51 7	3286
	Sun	E.	69 57 56	2805	68 23 35	2785	66 48 48	2766	65 13 36	2747
13	Spica	W.	65 58 29	2304	67 44 22	2287	69 30 41	2268	71 17 27	2251
	α Aquilæ	E.	40 56 44	3534	39 36 57	3612	38 18 36	3705	37 1 54	3814
	Sun	E.	57 11 7	2650	55 33 20	2632	53 55 8	2613	52 16 31	2596
14	Spica	W.	80 17 45	2166	82 7 4	2149	83 56 48	2134	85 46 55	2120
	Antares	W.	35 3 6	2208	36 51 21	2189	38 40 5	2170	40 29 17	2153
	Sun	E.	43 57 30	2512	42 16 34	2498	40 35 18	2485	38 53 43	2472
15	Spica	W.	95 2 56	2052	96 55 9	2041	98 47 40	2030	100 40 28	2019
	Antares	W.	49 41 34	2077	51 33 9	2063	53 25 5	2051	55 17 20	2040
	Sun	E.	30 21 43	2424	28 38 43	2419	26 55 36	2417	25 12 26	2418
19	Sun	W.	27 10 23	2431	28 53 13	2436	30 35 56	2444	32 18 28	2453
	Saturn	E.	39 45 16	2107	37 54 28	2123	36 4 4	2140	34 14 6	2158
	Jupiter	E.	51 1 35	2093	49 10 25	2105	47 19 34	2119	45 29 4	2134
	Aldebaran	E.	70 40 21	2072	68 48 38	2085	66 57 15	2098	65 6 12	2112
	Mars	E.	90 19 17	2125	88 28 56	2138	86 38 55	2151	84 49 14	2166
	Pollux	E.	112 40 12	2134	110 50 5	2144	109 0 13	2155	107 10 38	2168
20	Sun	W.	40 47 24	2515	42 28 16	2531	44 8 46	2546	45 48 55	2563
	Saturn	E.	25 11 37	2269	23 24 52	2298	21 38 49	2331	19 53 34	2368
	Jupiter	E.	36 22 14	2212	34 34 5	2230	32 46 22	2247	30 59 5	2266
	Aldebaran	E.	55 56 41	2192	54 8 1	2209	52 19 47	2227	50 32 0	2246
	Mars	E.	75 46 27	2245	73 59 6	2262	72 12 11	2280	70 25 42	2298
	Pollux	E.	98 7 38	2238	96 20 7	2253	94 32 59	2270	92 46 16	2287
21	Sun	W.	54 3 45	2652	55 41 29	2672	57 18 47	2690	58 55 40	2710
	Aldebaran	E.	41 40 10	2346	39 55 17	2367	38 10 55	2389	36 27 5	2412

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21	Mars	E.	68° 39′ 39″	2316	66° 54′ 3″	2335	65° 8′ 54″	2354	63° 24′ 13″	2373
	Pollux	E.	90 59 57	2304	89 14 4	2322	87 28 36	2340	85 43 35	2358
22	Sun	W.	60 32 7	2729	62 8 8	2749	63 43 43	2769	65 18 52	2788
	Aldebaran	E.	34 43 47	2436	33 1 3	2460	31 18 53	2485	29 37 19	2512
	Mars	E.	54 47 52	2474	53 6 2	2494	51 24 41	2515	49 43 49	2536
	Pollux	E.	77 5 14	2455	75 22 57	2475	73 41 9	2495	71 59 49	2515
	Regulus	E.	113 50 35	2403	112 7 4	2421	110 23 59	2439	108 41 20	2458
23	Sun	W.	73 8 13	2887	74 40 48	2906	76 12 59	2926	77 44 45	2945
	Mars	E.	41 26 48	2643	39 48 52	2665	38 11 25	2687	36 34 28	2710
	Pollux	E.	63 40 16	2619	62 1 47	2640	60 23 47	2662	58 46 16	2683
	Regulus	E.	100 14 32	2549	98 34 27	2567	96 54 47	2585	95 15 31	2603
24	Sun	W.	85 17 39	3038	86 47 5	3056	88 16 9	3073	89 44 52	3091
	α Arietis	W.	26 46 34	2852	28 19 54	2851	29 53 16	2852	31 26 37	2854
	Saturn	W.	23 35 27	2777	25 10 25	2784	26 45 14	2793	28 19 51	2803
	Mars	E.	28 37 23	2830	27 3 31	2856	25 30 19	2884	23 57 40	2915
	Pollux	E.	50 45 52	2793	49 11 15	2815	47 37 7	2838	46 3 29	2862
	Regulus	E.	87 5 14	2689	85 28 20	2706	83 51 48	2722	82 15 38	2738
25	Sun	W.	97 3 15	3173	98 29 57	3188	99 56 21	3202	101 22 28	3216
	α Arietis	W.	39 11 55	2886	40 44 32	2894	42 16 58	2902	43 49 14	2912
	Saturn	W.	36 9 29	2859	37 42 41	2870	39 15 38	2882	40 48 20	2894
	Jupiter	W.	24 15 40	2857	25 48 54	2869	27 21 52	2882	28 54 34	2894
	Pollux	E.	38 23 9	2990	36 52 44	3019	35 22 55	3050	33 53 44	3083
	Regulus	E.	74 19 58	2815	72 45 49	2829	71 11 59	2843	69 38 27	2857
26	Sun	W.	108 28 52	3284	109 53 22	3296	111 17 38	3308	112 41 40	3319
	α Arietis	W.	51 27 42	2955	52 58 51	2964	54 29 49	2973	56 0 36	2981
	Saturn	W.	48 28 15	2948	49 59 33	2958	51 30 39	2967	53 1 33	2977
	Jupiter	W.	36 34 15	2952	38 5 28	2963	39 36 27	2973	41 7 13	2983
	Aldebaran	W.	18 28 53	3060	19 57 51	3048	21 27 4	3041	22 56 26	3036
	Regulus	E.	61 55 4	2920	60 23 11	2932	58 51 33	2944	57 20 10	2955
	Spica	E.	115 46 44	2896	114 14 20	2907	112 42 10	2918	111 10 14	2928
27	Sun	W.	119 38 40	3372	121 1 29	3381	122 24 7	3390	123 46 35	3399
	α Arietis	W.	63 32 0	3018	65 1 50	3026	66 31 31	3033	68 1 3	3039
	Saturn	W.	60 33 8	3020	62 2 56	3027	63 32 35	3035	65 2 4	3042
	Jupiter	W.	48 38 5	3028	50 7 43	3036	51 37 11	3044	53 6 29	3052
	Aldebaran	W.	30 23 55	3037	31 53 22	3040	33 22 45	3043	34 52 4	3047
	Regulus	E.	49 46 38	3007	48 16 34	3017	46 46 42	3026	45 17 2	3035
	Spica	E.	103 33 38	2973	102 2 52	2981	100 32 16	2989	99 1 49	2997
28	Sun	W.	130 36 34	3438	131 58 8	3444	133 19 35	3451	134 40 54	3457
	α Arietis	W.	75 26 54	3067	76 55 44	3071	78 24 29	3076	79 53 8	3080
	Saturn	W.	72 27 30	3072	73 56 14	3077	75 24 52	3082	76 53 24	3087
	Jupiter	W.	60 30 53	3082	61 59 24	3088	63 27 48	3093	64 56 6	3097
	Aldebaran	W.	42 17 38	3064	43 46 32	3067	45 15 22	3069	46 44 9	3073
	Mars	W.	20 59 11	3257	22 24 13	3247	23 49 27	3238	25 14 51	3232
	Regulus	E.	37 51 29	3061	36 22 56	3090	34 54 34	3100	33 26 24	3109
	Spica	E.	91 31 44	3027	90 2 5	3033	88 32 33	3038	87 3 7	3042

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	Mars	E.	61 40 0	2393	59 56 15	2413	58 12 59	2433	56 30 11	2453
	Pollux	E.	83 59 0	2377	82 14 52	2396	80 31 12	2415	78 47 59	2435
22	Sun	W.	66 53 36	2808	68 27 54	2828	70 1 46	2848	71 35 12	2867
	Aldebaran	E.	27 56 22	2539	26 16 3	2569	24 36 25	2601	22 57 31	2636
	Mars	E.	48 3 26	2557	46 23 32	2579	44 44 8	2600	43 5 13	2622
	Pollux	E.	70 18 57	2536	68 38 34	2556	66 58 39	2577	65 19 13	2509
	Regulus	E.	106 59 7	2476	105 17 20	2494	103 35 58	2512	101 55 2	2531
23	Sun	W.	79 16 7	2964	80 47 5	2983	82 17 39	3001	83 47 50	3019
	Mars	E.	34 58 1	2733	33 22 5	2756	31 46 39	2780	30 11 45	2805
	Pollux	E.	57 9 13	2704	55 32 39	2726	53 56 34	2748	52 20 58	2771
	Regulus	E.	93 36 40	2621	91 58 13	2638	90 20 10	2655	88 42 30	2673
24	Sun	W.	91 13 13	3108	92 41 13	3124	94 8 53	3140	95 36 14	3157
	α Arietis	W.	32 59 55	2859	34 33 7	2864	36 6 12	2871	37 39 8	2878
	Saturn	W.	29 54 15	2814	31 28 25	2825	33 2 21	2836	34 36 2	2847
	Mars	E.	22 25 40	2947	20 54 21	2984	19 23 48	3026	17 54 7	3074
	Pollux	E.	44 30 22	2887	42 57 46	2911	41 25 41	2936	39 54 8	2963
	Regulus	E.	80 39 49	2754	79 4 21	2769	77 29 13	2785	75 54 26	2800
25	Sun	W.	102 48 18	3231	104 13 51	3245	105 39 7	3259	107 4 7	3271
	α Arietis	W.	45 21 18	2920	46 53 11	2930	48 24 52	2939	49 56 22	2946
	Saturn	W.	42 20 47	2905	43 53 0	2816	45 24 59	2927	46 56 44	2938
	Jupiter	W.	30 27 0	2906	31 59 11	2918	33 31 7	2930	35 2 48	2941
	Pollux	E.	32 25 14	3119	30 57 27	3156	29 30 25	3198	28 4 14	3245
	Regulus	E.	68 5 13	2870	66 32 16	2883	64 59 36	2896	63 27 12	2909
26	Sun	W.	114 5 29	3331	115 29 5	3342	116 52 28	3351	118 15 40	3362
	α Arietis	W.	57 31 12	2989	59 1 38	2997	60 31 55	3005	62 2 2	3012
	Saturn	W.	54 32 14	2986	56 2 44	2996	57 33 2	3004	59 3 10	3012
	Jupiter	W.	42 37 47	2993	44 8 9	3002	45 38 19	3012	47 8 17	3020
	Aldebaran	W.	24 25 54	3034	25 55 25	3034	27 24 56	3034	28 54 26	3035
	Regulus	E.	55 49 1	2965	54 18 5	2977	52 47 23	2987	51 16 54	2997
	Spica	E.	109 38 31	2938	108 7 0	2947	106 35 41	2957	105 4 34	2965
27	Sun	W.	125 8 53	3407	126 31 2	3415	127 53 1	3423	129 14 52	3431
	α Arietis	W.	69 30 27	3045	70 59 44	3051	72 28 54	3056	73 57 57	3061
	Saturn	W.	66 31 25	3048	68 0 38	3055	69 29 43	3061	70 58 40	3067
	Jupiter	W.	54 35 37	3059	56 4 37	3065	57 33 30	3071	59 2 15	3077
	Aldebaran	W.	36 21 19	3050	37 50 30	3053	39 19 37	3056	40 48 40	3060
	Regulus	E.	43 47 33	3044	42 18 15	3053	40 49 8	3063	39 20 13	3072
	Spica	E.	97 31 32	3003	96 1 23	3010	94 31 23	3016	93 1 30	3022
28	Sun	W.	136 2 6	3463	137 23 11	3470	138 44 9	3475	140 5 1	3481
	α Arietis	W.	81 21 42	3084	82 50 11	3088	84 18 35	3091	85 46 55	3094
	Saturn	W.	78 21 50	3091	79 50 11	3094	81 18 28	3098	82 46 40	3101
	Jupiter	W.	66 24 19	3101	67 52 27	3105	69 20 30	3110	70 48 28	3114
	Aldebaran	W.	48 12 52	3075	49 41 32	3078	51 10 8	3081	52 38 41	3082
	Mars	W.	26 40 22	3228	28 5 58	3225	29 31 37	3223	30 57 19	3221
	Regulus	E.	31 58 25	3119	30 30 38	3130	29 3 5	3142	27 35 46	3153
	Spica	E.	85 33 46	3047	84 4 31	3050	82 35 20	3054	81 6 14	3057

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	22 49 18.10	9.353	S. 7 30 14.1	+57.00	16 10.34	65.42	12 30.84	0.503
Thur.	2	22 53 2.34	9.332	7 7 22.9	57.25	16 10.10	65.35	12 18.55	0.524
Frid.	3	22 56 46.07	9.312	6 44 25.7	57.49	16 9.86	65.28	12 5.77	0.544
Sat.	4	23 0 29.32	9.293	6 21 22.8	+57.71	16 9.61	65.21	11 52.50	0.563
Sun.	5	23 4 12.12	9.275	5 58 14.7	57.93	16 9.36	65.14	11 38.79	0.581
Mon.	6	23 7 54.49	9.257	5 35 1.7	58.13	16 9.10	65.08	11 24.65	0.599
Tues.	7	23 11 36.45	9.240	5 11 44.2	+58.32	16 8.84	65.02	11 10.10	0.615
Wed.	8	23 15 18.04	9.225	4 48 22.5	58.48	16 8.58	64.96	10 55.17	0.630
Thur.	9	23 18 59.26	9.210	4 24 57.0	58.64	16 8.32	64.91	10 39.88	0.645
Frid.	10	23 22 40.15	9.197	4 1 28.0	+58.77	16 8.05	64.86	10 24.25	0.658
Sat.	11	23 26 20.72	9.183	3 37 55.9	58.89	16 7.78	64.82	10 8.31	0.671
Sun.	12	23 30 1.00	9.172	3 14 21.1	58.99	16 7.51	64.77	9 52.09	0.683
Mon.	13	23 33 41.01	9.161	2 50 44.1	+59.09	16 7.24	64.73	9 35.59	0.694
Tues.	14	23 37 20.76	9.151	2 27 5.1	59.15	16 6.97	64.69	9 18.82	0.704
Wed.	15	23 41 0.27	9.142	2 3 24.6	59.21	16 6.70	64.66	9 1.81	0.713
Thur.	16	23 44 39.56	9.133	1 39 42.9	+59.24	16 6.43	64.62	8 44.60	0.722
Frid.	17	23 48 18.65	9.125	1 16 0.5	59.28	16 6.15	64.59	8 27.21	0.730
Sat.	18	23 51 57.57	9.118	0 52 17.8	59.28	16 5.88	64.56	8 9.63	0.737
Sun.	19	23 55 36.32	9.111	0 28 35.1	+59.28	16 5.61	64.54	7 51.87	0.744
Mon.	20	23 59 14.92	9.105	S. 0 4 52.7	59.25	16 5.34	64.52	7 33.96	0.750
Tues.	21	0 2 53.39	9.100	N. 0 18 49.0	59.21	16 5.06	64.50	7 15.93	0.755
Wed.	22	0 6 31.74	9.096	0 42 29.5	+59.15	16 4.79	64.49	6 57.79	0.759
Thur.	23	0 10 10.01	9.093	1 6 8.5	59.09	16 4.52	64.48	6 39.55	0.762
Frid.	24	0 13 48.19	9.089	1 29 45.4	59.00	16 4.25	64.47	6 21.23	0.766
Sat.	25	0 17 26.31	9.087	1 53 20.1	+58.90	16 3.98	64.46	6 2.84	0.768
Sun.	26	0 21 4.38	9.086	2 16 52.2	58.77	16 3.71	64.46	5 44.40	0.769
Mon.	27	0 24 42.43	9.085	2 40 21.4	58.65	16 3.44	64.46	5 25.95	0.770
Tues.	28	0 28 20.47	9.086	3 3 47.3	+58.50	16 3.17	64.46	5 7.49	0.769
Wed.	29	0 31 58.53	9.087	3 27 9.4	58.35	16 2.89	64.47	4 49.05	0.768
Thur.	30	0 35 36.63	9.089	3 50 27.5	58.17	16 2.62	64.48	4 30.65	0.766
Frid.	31	0 39 14.79	9.092	4 13 41.4	57.98	16 2.35	64.49	4 12.31	0.763
Sat.	32	0 42 53.03	9.096	N. 4 36 50.6	+57.78	16 2.08	64.51	3 54.05	0.759

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	22 49 16.15	9.354	S. 7 30 26.0	+57.01	12 30.94	0.503	22 36 45.21
Thur.	2	22 53 0.42	9.333	7 7 34.7	57.26	12 18.65	0.524	22 40 41.77
Frid.	3	22 56 44.19	9.313	6 44 37.3	57.50	12 5.87	0.544	22 44 38.32
Sat.	4	23 0 27.48	9.294	6 21 34.3	+57.72	11 52.60	0.563	22 48 34.88
Sun.	5	23 4 10.32	9.276	5 58 26.0	57.94	11 38.90	0.581	22 52 31.42
Mon.	6	23 7 52.73	9.258	5 35 12.8	58.14	11 24.75	0.599	22 56 27.98
Tues.	7	23 11 34.73	9.242	5 11 55.1	+58.33	11 10.21	0.615	23 0 24.52
Wed.	8	23 15 16.36	9.227	4 48 33.1	58.49	10 55.28	0.630	23 4 21.08
Thur.	9	23 18 57.62	9.212	4 25 7.3	58.65	10 39.99	0.645	23 8 17.63
Frid.	10	23 22 38.55	9.199	4 1 38.1	+58.78	10 24.36	0.658	23 12 14.19
Sat.	11	23 26 19.16	9.185	3 38 5.8	58.90	10 8.42	0.671	23 16 10.74
Sun.	12	23 29 59.49	9.174	3 14 30.8	59.00	9 52.19	0.683	23 20 7.30
Mon.	13	23 33 39.54	9.163	2 50 53.5	+59.10	9 35.70	0.694	23 24 3.84
Tues.	14	23 37 19.33	9.153	2 27 14.3	59.16	9 18.93	0.704	23 28 0.40
Wed.	15	23 40 58.88	9.144	2 3 33.5	59.22	9 1.98	0.713	23 31 56.95
Thur.	16	23 44 38.22	9.135	1 39 51.6	+59 25	8 44.71	0.722	23 35 53.51
Frid.	17	23 48 17.36	9.127	1 16 8.9	59.29	8 27.31	0.730	23 39 50.05
Sat.	18	23 51 56.32	9.120	0 52 25.9	59.29	8 9.73	0.737	23 43 46.61
Sun.	19	23 55 35.12	9.113	0 28 42.9	+59.29	7 51.97	0.744	23 47 43.15
Mon.	20	23 59 13.77	9.107	S. 0 5 0.2	59.26	7 34.06	0.750	23 51 39.71
Tues.	21	0 2 52.29	9.102	N. 0 18 41.8	59.22	7 16.02	0.755	23 55 36.27
Wed.	22	0 6 30.69	9.098	0 42 22.6	+59.16	6 57.87	0.759	23 59 32.82
Thur.	23	0 10 9.00	9.095	1 6 1.9	59.10	6 39.63	0.762	0 3 29.37
Frid.	24	0 13 47.23	9.091	1 29 39.1	59.01	6 21.31	0.766	0 7 25.92
Sat.	25	0 17 25.89	9.089	1 53 14.1	+58.91	6 2.92	0.768	0 11 22.47
Sun.	26	0 21 3.50	9.088	2 16 46.5	58.78	5 44.48	0.769	0 15 19.02
Mon.	27	0 24 41.60	9.087	2 40 16.0	58.66	5 26.02	0.770	0 19 15.58
Tues.	28	0 28 19.69	9.088	3 3 42.2	+58.51	5 7.56	0.769	0 23 12.13
Wed.	29	0 31 57.81	9.089	3 27 4.6	58.36	4 49.12	0.768	0 27 8.68
Thur.	30	0 35 35.95	9.091	3 50 23.1	58.18	4 30.71	0.766	0 31 5.23
Frid.	31	0 39 14.15	9.094	4 13 37.3	57.99	4 12.37	0.763	0 35 1.78
Sat.	32	0 42 52.44	9.098	N. 4 36 46.8	+57.79	3 54.10	0.759	0 38 58.34

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour, + 9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	60	340 50 32.7	50 7.9	150.34	− 0.17	9.9962493	+ 44.6	1 23 1.15
2	61	341 50 40.0	50 15.1	150.26	0.22	9.9963572	45.3	1 19 5.24
3	62	342 50 45.3	50 20.3	150.18	0.26	9.9964667	46.0	1 15 9.33
4	63	343 50 48.7	50 23.6	150.10	− 0.27	9.9965778	+ 46.7	1 11 13.42
5	64	344 50 50.3	50 25.1	150.03	0.24	9.9966906	47.3	1 7 17.52
6	65	345 50 50.1	50 24.9	149.95	0.19	9.9968049	47.9	1 3 21.61
7	66	346 50 48.0	50 22.6	149.88	− 0.10	9.9969206	+ 48.5	0 59 25.71
8	67	347 50 44.3	50 18.8	149.81	0.00	9.9970377	49.0	0 55 29.80
9	68	348 50 38.9	50 13.3	149.74	+ 0.12	9.9971560	49.5	0 51 33.90
10	69	349 50 31.7	50 6.0	149.67	+ 0.25	9.9972755	+ 49.9	0 47 37.99
11	70	350 50 22.8	49 57.1	149.59	0.39	9.9973959	50.3	0 43 42.08
12	71	351 50 12.3	49 46.5	149.52	0.52	9.9975172	50.6	0 39 46.17
13	72	352 50 0.1	49 34.2	149.45	+ 0.63	9.9976391	+ 50.9	0 35 50.27
14	73	353 49 46.2	49 20.2	149.38	0.72	9.9977614	51.1	0 31 54.36
15	74	354 49 30.6	49 4.5	149.31	0.79	9.9978840	51.2	0 27 58.45
16	75	355 49 13.2	48 47.0	149.24	+ 0.84	9.9980069	+ 51.2	0 24 2.55
17	76	356 48 54.0	48 27.7	149.16	0.86	9.9981298	51.2	0 20 6.65
18	77	357 48 33.0	48 6.6	149.08	0.83	9.9982527	51.1	0 16 10.74
19	78	358 48 10.0	47 43.5	149.00	+ 0.79	9.9983755	+ 51.1	0 12 14.83
20	79	359 47 44.9	47 18.4	148.91	0.71	9.9984980	51.0	0 8 18.92
21	80	0 47 17.8	46 51.2	148.82	0.62	9.9986203	50.9	0 4 23.01
22	81	1 46 48.5	46 21.8	148.73	+ 0.50	9.9987424	+ 50.9	0 0 27.10 23 56 31.19
23	82	2 46 17.0	45 50.2	148.64	0.37	9.9988644	50.8	23 52 35.28
24	83	3 45 43.2	45 16.3	148.55	0.23	9.9989862	50.8	23 48 39.39
25	84	4 45 7.2	44 40.2	148.45	+ 0.09	9.9991079	+ 50.7	23 44 43.48
26	85	5 44 28.9	44 1.8	148.36	− 0.04	9.9992296	50.7	23 40 47.57
27	86	6 43 48.3	43 21.1	148.26	0.15	9.9993514	50.8	23 36 51.66
28	87	7 43 5.3	42 38.0	148.17	− 0.25	9.9994734	+ 50.9	23 32 55.77
29	88	8 42 20.0	41 52.6	148.07	0.32	9.9995957	51.0	23 28 59.86
30	89	9 41 32.5	41 5.0	147.98	0.36	9.9997184	51.1	23 25 3.95
31	90	10 40 42.6	40 15.1	147.88	0.37	9.9998414	51.3	23 21 8.04
32	91	11 39 50.5	39 23.0	147.79	− 0.36	9.9999648	+ 51.5	23 17 12.14

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
$-9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 47.1	14 45.6	54 8.6	− 0.53	54 3.2	− 0.38	9 56.1	1.84	11.4
2	14 44.6	14 44.0	53 59.5	− 0.24	53 57.4	− 0.11	10 39.5	1.78	12.4
3	14 43.8	14 44.1	53 56.8	+ 0.01	53 57.6	+ 0.12	11 21.7	1.74	13.4
4	14 44.6	14 45.6	53 59.7	+ 0.22	54 3.1	+ 0.33	12 3.2	1.73	14.4
5	14 46.8	14 48.4	54 7.8	0.44	54 13.7	0.54	12 44.7	1.74	15.4
6	14 50.4	14 52.6	54 20.8	0.64	54 29.1	0.74	13 27.0	1.79	16.4
7	14 55.3	14 58.2	54 38.7	+ 0.85	54 49.6	+ 0.96	14 10.7	1.86	17.4
8	15 1.5	15 5.2	55 1 8	1.07	55 15.4	1.19	14 56.5	1.96	18.4
9	15 9.3	15 13.8	55 30.4	1.31	55 46.8	1.42	15 44.7	2.07	19.4
10	15 18.6	15 23.9	56 4.6	+ 1.54	56 23.9	+ 1.66	16 35.7	2.19	20.4
11	15 29.5	15 35.5	56 44.5	1.77	57 6.4	1.87	17 29.4	2.29	21.4
12	15 41.7	15 48.3	57 29.4	1.96	57 53.4	2.02	18 25.1	2.35	22.4
13	15 55.0	16 1.7	58 18.0	+ 2.06	58 42.8	+ 2.07	19 21.9	2.38	23.4
14	16 8.4	16 15.0	59 7.5	2.04	59 31.5	1.96	20 18.9	2.36	24.4
15	16 21.2	16 26.8	59 54.3	1.83	60 15.1	1.64	21 15.3	2.33	25.4
16	16 31.8	16 35.9	60 33.3	+ 1.40	60 48.3	+ 1.11	22 10.9	2.29	26.4
17	16 39.0	16 40.9	60 59.6	+ 0.76	61 6.6	+ 0.39	23 5.7	2.27	27.4
18	16 41.6	16 40.9	61 9.1	0.00	61 6.8	− 0.38	☌		28.4
19	16 39.0	16 35.9	60 59.9	− 0.76	60 48.5	− 1.13	0 0.1	2.27	29.4
20	16 31.7	16 26.4	60 32.8	1.47	60 13.3	1.76	0 54.6	2.28	1.0
21	16 20.2	16 13.3	59 50.6	2.00	59 25.4	2.19	1 49.5	2.30	2.0
22	16 5.9	15 58.3	58 58.3	− 2.31	58 30.1	− 2.38	2 44.9	2.31	3.0
23	15 50.4	15 42.6	58 1.3	2.40	57 32.7	2.37	3 40.3	2.29	4.0
24	15 35.0	15 27.7	57 4.7	2.29	56 38.0	2.18	4 34.9	2.25	5.0
25	15 20.8	15 14.5	56 12.7	− 2.04	55 49.3	− 1.87	5 27.9	2.17	6.0
26	15 8.7	15 3.4	55 27.9	1.69	55 8.8	1.49	6 18.7	2.07	7.0
27	14 58.9	14 55.0	54 52.1	1.29	54 37.8	1.09	7 7.1	1.96	8.0
28	14 51.8	14 49.2	54 26.0	− 0.88	54 16.6	− 0.68	7 53.1	1.87	9.0
29	14 47.3	14 46.1	54 9.6	0.48	54 4.9	− 0.30	8 37.1	1.80	10.0
30	14 45.3	14 45.2	54 2.3	− 0.13	54 1.8	+ 0.04	9 19.6	1.75	11.0
31	14 45.6	14 46.5	54 3.2	+ 0.19	54 6.4	0.34	10 1.3	1.73	12.0
32	14 47.8	14 49.5	54 11.3	+ 0.46	54 17.6	+ 0.57	10 42.9	1.74	13.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	WEDNESDAY 1.					**FRIDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 14 57.34	1.9787	N.15 27 27.8	7.890	0	9 47 0.37	1.8688	N. 8 7 35.0	10.186
1	8 16 55.97	1.9757	15 19 32.5	7.953	1	9 48 52.46	1.8674	7 57 22.9	10.218
2	8 18 54.43	1.9728	15 11 33.4	8.016	2	9 50 44.46	1.8659	7 47 8.9	10.249
3	8 20 52.71	1.9699	15 3 30.5	8.078	3	9 52 36.37	1.8645	7 36 53.0	10.280
4	8 22 50.82	1.9670	14 55 24.0	8.139	4	9 54 28.20	1.8632	7 26 35.3	10.309
5	8 24 48.75	1.9641	14 47 13.8	8.200	5	9 56 19.96	1.8620	7 16 15.9	10.338
6	8 26 46.51	1.9612	14 39 0.0	8.260	6	9 58 11.64	1.8607	7 5 54.7	10.367
7	8 28 44.10	1.9584	14 30 42.6	8.319	7	10 0 3.25	1.8595	6 55 31.8	10.395
8	8 30 41.52	1.9557	14 22 21.7	8.378	8	10 1 54.78	1.8583	6 45 7.3	10.422
9	8 32 38.78	1.9529	14 13 57.2	8.436	9	10 3 46.24	1.8572	6 34 41.2	10.448
10	8 34 35.87	1.9502	14 5 29.3	8.493	10	10 5 37.64	1.8562	6 24 13.5	10.475
11	8 36 32.80	1.9474	13 56 58.0	8.550	11	10 7 28.98	1.8551	6 13 44.2	10.501
12	8 38 29.56	1.9447	13 48 23.3	8.607	12	10 9 20.25	1.8540	6 3 13.4	10.525
13	8 40 26.16	1.9420	13 39 45.2	8.662	13	10 11 11.46	1.8531	5 52 41.2	10.549
14	8 42 22.60	1.9394	13 31 3.9	8.716	14	10 13 2.62	1.8522	5 42 7.6	10.573
15	8 44 18.89	1.9369	13 22 19.3	8.770	15	10 14 53.72	1.8513	5 31 32.5	10.596
16	8 46 15.03	1.9343	13 13 31.5	8.824	16	10 16 44.77	1.8504	5 20 56.1	10.617
17	8 48 11.01	1.9317	13 4 40.5	8.877	17	10 18 35.77	1.8497	5 10 18.4	10.638
18	8 50 6.83	1.9291	12 55 46.3	8.929	18	10 20 26.73	1.8489	4 59 39.5	10.659
19	8 52 2.50	1.9267	12 46 49.0	8.980	19	10 22 17.64	1.8482	4 48 59.3	10.679
20	8 53 58.03	1.9242	12 37 48.7	9.030	20	10 24 8.51	1.8475	4 38 18.0	10.698
21	8 55 53.41	1.9218	12 28 45.4	9.080	21	10 25 59.34	1.8468	4 27 35.5	10.717
22	8 57 48.65	1.9194	12 19 39.1	9.130	22	10 27 50.13	1.8462	4 16 51.9	10.735
23	8 59 43.74	1.9170	N.12 10 29.8	9.179	23	10 29 40.89	1.8457	N. 4 6 7.3	10.753
	THURSDAY 2.					**SATURDAY 4.**			
0	9 1 38.69	1.9147	N.12 1 17.6	9.227	0	10 31 31.61	1.8452	N. 3 55 21.6	10.770
1	9 3 33.50	1.9123	11 52 2.6	9.274	1	10 33 22.31	1.8447	3 44 34.9	10.786
2	9 5 28.17	1.9101	11 42 44.7	9.321	2	10 35 12.98	1.8443	3 33 47.3	10.802
3	9 7 22.71	1.9079	11 33 24.0	9.368	3	10 37 3.63	1.8439	3 22 58.7	10.817
4	9 9 17.12	1.9057	11 24 0.5	9.413	4	10 38 54.25	1.8436	3 12 9.2	10.831
5	9 11 11.39	1.9034	11 14 34.4	9.458	5	10 40 44.86	1.8433	3 1 19.0	10.844
6	9 13 5.53	1.9012	11 5 5.6	9.502	6	10 42 35.45	1.8430	2 50 28.0	10.857
7	9 14 59.54	1.8992	10 55 34.2	9.545	7	10 44 26.02	1.8428	2 39 36.2	10.869
8	9 16 53.43	1.8972	10 46 0.2	9.588	8	10 46 16.59	1.8427	2 28 43.7	10.881
9	9 18 47.20	1.8952	10 36 23.6	9.631	9	10 48 7.15	1.8426	2 17 50.5	10.892
10	9 20 40.85	1.8932	10 26 44.5	9.672	10	10 49 57.70	1.8425	2 6 56.6	10.902
11	9 22 34.38	1.8912	10 17 2.9	9.713	11	10 51 48.25	1.8425	1 56 2.2	10.912
12	9 24 27.79	1.8892	10 7 18.9	9.753	12	10 53 38.80	1.8425	1 45 7.2	10.921
13	9 26 21.09	1.8873	9 57 32.5	9.793	13	10 55 29.35	1.8426	1 34 11.7	10.929
14	9 28 14.27	1.8854	9 47 43.8	9.832	14	10 57 19.91	1.8427	1 23 15.7	10.937
15	9 30 7.34	1.8837	9 37 52.7	9.871	15	10 59 10.47	1.8428	1 12 19.2	10.945
16	9 32 0.31	1.8819	9 27 59.3	9.908	16	11 1 1.04	1.8430	1 1 22.3	10.951
17	9 33 53.17	1.8801	9 18 3.7	9.945	17	11 2 51.63	1.8433	0 50 25.1	10.956
18	9 35 45.92	1.8783	9 8 5.9	9.981	18	11 4 42.24	1.8436	0 39 27.6	10.961
19	9 37 38.57	1.8767	8 58 6.0	10.017	19	11 6 32.86	1.8438	0 28 29.8	10.965
20	9 39 31.12	1.8750	8 48 3.9	10.052	20	11 8 23.50	1.8442	0 17 31.8	10.969
21	9 41 23.57	1.8734	8 37 59.7	10.087	21	11 10 14.17	1.8447	N. 0 6 33.5	10.973
22	9 43 15.93	1.8719	8 27 53.4	10.121	22	11 12 4.86	1.8451	S. 0 4 25.0	10.975
23	9 45 8.20	1.8703	8 17 45.2	10.154	23	11 13 55.58	1.8456	0 15 23.5	10.976
24	9 47 0.37	1.8688	N. 8 7 35.0	10.186	24	11 15 46.33	1.8462	S. 0 26 22.1	10.977

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 15 46.33	1.8462	S. 0 26 22.1	10.977
1	11 17 37.12	1.8468	0 37 20.8	10.978
2	11 19 27.94	1.8474	0 48 19.5	10.977
3	11 21 18.80	1.8481	0 59 18.1	10.976
4	11 23 9.71	1.8488	1 10 16.6	10.974
5	11 25 0.66	1.8496	1 21 15.0	10.972
6	11 26 51.66	1.8504	1 32 13.3	10.970
7	11 28 42.71	1.8513	1 43 11.4	10.966
8	11 30 33.81	1.8522	1 54 9.2	10.961
9	11 32 24.97	1.8531	2 5 6.7	10.956
10	11 34 16.18	1.8541	2 16 3.9	10.950
11	11 36 7.46	1.8552	2 27 0.7	10.943
12	11 37 58.80	1.8562	2 37 57.1	10.936
13	11 39 50.20	1.8573	2 48 53.0	10.929
14	11 41 41.68	1.8586	2 59 48.5	10.921
15	11 43 33.23	1.8598	3 10 43.5	10.912
16	11 45 24.86	1.8611	3 21 37.9	10.901
17	11 47 16.56	1.8623	3 32 31.6	10.890
18	11 49 8.34	1.8637	3 43 24.7	10.879
19	11 51 0.21	1.8652	3 54 17.1	10.867
20	11 52 52.16	1.8666	4 5 8.8	10.855
21	11 54 44.20	1.8681	4 15 59.7	10.841
22	11 56 36.33	1.8696	4 26 49.7	10.827
23	11 58 28.55	1.8712	S. 4 37 38.9	10.813

MONDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 0 20.87	1.8728	S. 4 48 27.2	10 798
1	12 2 13.29	1.8745	4 59 14.6	10.781
2	12 4 5.81	1 8762	5 10 0.9	10.763
3	12 5 58.43	1.8779	5 20 46.2	10.746
4	12 7 51.16	1.8798	5 31 30.4	10.728
5	12 9 44.00	1.8817	5 42 13.5	10.709
6	12 11 36.96	1.8836	5 52 55.5	10.689
7	12 13 30.03	1.8855	6 3 36.2	10.668
8	12 15 23.22	1.8874	6 14 15.7	10.647
9	12 17 16.52	1.8894	6 24 53.9	10.626
10	12 19 9.95	1.8916	6 35 30.8	10.603
11	12 21 3.51	1.8937	6 46 6.3	10.580
12	12 22 57.19	1.8958	6 56 40.4	10.556
13	12 24 51.00	1.8980	7 7 13 0	10.531
14	12 26 44.95	1.9002	7 17 44.1	10.506
15	12 28 39.03	1.9025	7 28 13.7	10.480
16	12 30 33.25	1.9048	7 38 41.7	10.452
17	12 32 27.61	1.9072	7 49 8.0	10.423
18	12 34 22.12	1.9097	7 59 32.5	10.394
19	12 36 16.77	1.9121	8 9 55.3	10.366
20	12 38 11.57	1.9146	8 20 16.4	10.337
21	12 40 6.52	1.9171	8 30 35.7	10.306
22	12 42 1.63	1.9197	8 40 53.1	10.274
23	12 43 56.89	1.9223	8 51 8.6	10.241
24	12 45 52.31	1.9250	S. 9 1 22.1	10.208

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 45 52.31	1.9250	S. 9 1 22.1	10.208
1	12 47 47.89	1.9277	9 11 33.6	10.175
2	12 49 43.64	1.9305	9 21 43.1	10.141
3	12 51 39.55	1.9333	9 31 50.5	10.106
4	12 53 35.63	1.9361	9 41 55.8	10.069
5	12 55 31.88	1.9389	9 51 58.8	10.032
6	12 57 28.30	1.9418	10 1 59.6	9.994
7	12 59 24.90	1.9448	10 11 58.1	9.956
8	13 1 21.68	1.9478	10 21 54.3	9.917
9	13 3 18.63	1.9508	10 31 48.2	9.878
10	13 5 15.77	1.9539	10 41 39.7	9.837
11	13 7 13.10	1.9570	10 51 28.7	9.795
12	13 9 10.61	1.9601	11 1 15.1	9.752
13	13 11 8.31	1.9633	11 10 59.0	9.710
14	13 13 6.21	1.9666	11 20 40.3	9.667
15	13 15 4.30	1.9699	11 30 19.0	9.622
16	13 17 2.59	1.9732	11 39 54.9	9.576
17	13 19 1.08	1.9764	11 49 28.1	9.530
18	13 20 59.76	1.9798	11 58 58 5	9.483
19	13 22 58.65	1.9832	12 8 26.1	9.436
20	13 24 57.74	1.9866	12 17 50.8	9.387
21	13 26 57.04	1.9901	12 27 12.5	9.337
22	13 28 56.55	1.9936	12 36 31.2	9.287
23	13 30 56.27	1.9972	S. 12 45 46.9	9.237

WEDNESDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	13 32 56.21	2.0007	S. 12 54 59.6	9.185
1	13 34 56.36	2.0043	13 4 9.1	9.132
2	13 36 56.73	2.0080	13 13 15.4	9.078
3	13 38 57.32	2.0117	13 22 18.5	9.024
4	13 40 58.13	2.0153	13 31 18.3	8.969
5	13 42 59.16	2.0191	13 40 14.8	8.913
6	13 45 0.42	2.0229	13 49 7.9	8.856
7	13 47 1.91	2.0267	13 57 57.5	8.798
8	13 49 3.62	2.0304	14 6 43.7	6.741
9	13 51 5.56	2.0343	14 15 26.4	8.682
10	13 53 7.73	2.0382	14 24 5.5	8.621
11	13 55 10.14	2.0421	14 32 40.9	8.560
12	13 57 12.78	2.0460	14 41 12.7	8.499
13	13 59 15.66	2.0500	14 49 40.8	8.436
14	14 1 18.78	2.0540	14 58 5.0	8.372
15	14 3 22.14	2.0580	15 6 25.4	8.308
16	14 5 25.74	2.0620	15 14 42.0	8.243
17	14 7 29.58	2.0661	15 22 54.6	8.177
18	14 9 33.67	2.0702	15 31 3.2	8.110
19	14 11 38.00	2.0743	15 39 7.8	8.042
20	14 13 42.58	2.0784	15 47 8.3	7.974
21	14 15 47.41	2.0826	15 55 4.7	7.905
22	14 17 52.49	2.0867	16 2 56.9	7.834
23	14 19 57.82	2.0909	16 10 44.8	7.763
24	14 22 3.40	2.0951	S. 16 18 28.5	7.692

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	THURSDAY 9.					**SATURDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 22 3.40	2.0951	S. 16 18 28.5	7.692	0	16 7 36.47	2.3007	S. 20 48 38.4	3.246
1	14 24 9.23	2.0993	16 26 7.8	7.619	1	16 9 54.63	2.3047	20 51 49.8	3.133
2	14 26 15.32	2.1036	16 33 42.7	7.545	2	16 12 13.03	2.3087	20 54 54.4	3.020
3	14 28 21.66	2.1078	16 41 13.2	7.471	3	16 14 31.67	2.3126	20 57 52.2	2.907
4	14 30 28.26	2.1121	16 48 39.2	7.395	4	16 16 50.54	2.3163	21 0 43.2	2.792
5	14 32 35.11	2.1164	16 56 0.6	7.319	5	16 19 9.63	2.3201	21 3 27.2	2.676
6	14 34 42.23	2.1208	17 3 17.5	7.242	6	16 21 28.95	2.3238	21 6 4.3	2.561
7	14 36 49.61	2.1251	17 10 29.7	7.164	7	16 23 48.49	2.3275	21 8 34.5	2.444
8	14 38 57.24	2.1294	17 17 37.2	7.086	8	16 26 8.25	2.3312	21 10 57.6	2.327
9	14 41 5.13	2.1337	17 24 40.0	7.007	9	16 28 28.23	2.3348	21 13 13.7	2.209
10	14 43 13.28	2.1380	17 31 38.0	6.926	10	16 30 48.43	2.3385	21 15 22.7	2.091
11	14 45 21.69	2.1424	17 38 31.1	6.844	11	16 33 8.85	2.3421	21 17 24.6	1.972
12	14 47 30.37	2.1468	17 45 19.2	6.761	12	16 35 29.48	2.3455	21 19 19.3	1.852
13	14 49 39.31	2.1512	17 52 2.4	6.678	13	16 37 50.31	2.3489	21 21 6.8	1.732
14	14 51 48.51	2.1555	17 58 40.6	6.595	14	16 40 11.35	2.3524	21 22 47.1	1.611
15	14 53 57.97	2.1599	18 5 13.8	6.511	15	16 42 32.60	2.3558	21 24 20.1	1.489
16	14 56 7.70	2.1643	18 11 41.9	6.425	16	16 44 54.05	2.3591	21 25 45.8	1.366
17	14 58 17.69	2.1687	18 18 4.8	6.338	17	16 47 15.69	2.3623	21 27 4.1	1.243
18	15 0 27.94	2.1731	18 24 22.4	6.250	18	16 49 37.53	2.3656	21 28 15.0	1.120
19	15 2 38.46	2.1775	18 30 34.8	6.162	19	16 51 59.56	2.3688	21 29 18.5	0.997
20	15 4 49.24	2.1819	18 36 41.9	6.073	20	16 54 21.78	2.3719	21 30 14.6	0.872
21	15 7 0.29	2.1863	18 42 43.6	5.983	21	16 56 44.19	2.3750	21 31 3.2	0.747
22	15 9 11.60	2.1907	18 48 39.9	5.893	22	16 59 6.78	2.3779	21 31 44.3	0.622
23	15 11 23.17	2.1951	S. 18 54 30.7	5.802	23	17 1 29.54	2.3808	S. 21 32 17.8	0.496
	FRIDAY 10.					**SUNDAY 12.**			
0	15 13 35.01	2.1995	S. 19 0 16.1	5.710	0	17 3 52.48	2.3838	S. 21 32 43.8	0.370
1	15 15 47.11	2.2038	19 5 55.9	5.616	1	17 6 15.60	2.3866	21 33 2.2	0.243
2	15 17 59.47	2.2082	19 11 30.0	5.522	2	17 8 38.88	2.3894	21 33 12.9	− 0.115
3	15 20 12.10	2.2126	19 16 58.5	5.427	3	17 11 2.33	2.3922	21 33 16.0	+ 0.013
4	15 22 24.99	2.2170	19 22 21.3	5.331	4	17 13 25.94	2.3949	21 33 11.4	0.141
5	15 24 38.14	2.2213	19 27 38.2	5.233	5	17 15 49.71	2.3975	21 32 59.1	0.269
6	15 26 51.55	2.2257	19 32 49.3	5.136	6	17 18 13.64	2.4001	21 32 39.1	0.398
7	15 29 5.22	2.2300	19 37 54.5	5.038	7	17 20 37.72	2.4026	21 32 11.3	0.528
8	15 31 19.15	2.2343	19 42 53.8	4.939	8	17 23 1.95	2.4050	21 31 35.7	0.657
9	15 33 33.34	2.2387	19 47 47.2	4.840	9	17 25 26.32	2.4074	21 30 52.4	0.787
10	15 35 47.79	2.2429	19 52 34.6	4.739	10	17 27 50.84	2.4097	21 30 1.2	0.918
11	15 38 2.49	2.2472	19 57 15.9	4.637	11	17 30 15.49	2.4120	21 29 2.2	1.049
12	15 40 17.45	2.2514	20 1 51.0	4.534	12	17 32 40.28	2.4142	21 27 55.3	1.180
13	15 42 32.66	2.2557	20 6 20.0	4.431	13	17 35 5.20	2.4163	21 26 40.6	1.311
14	15 44 48.13	2.2599	20 10 42.8	4.327	14	17 37 30.24	2.4184	21 25 18.0	1.443
15	15 47 3.85	2.2641	20 14 59.3	4.222	15	17 39 55.41	2.4205	21 23 47.5	1.576
16	15 49 19.82	2.2683	20 19 9.5	4.117	16	17 42 20.70	2.4224	21 22 8.9	1.708
17	15 51 36.04	2.2725	20 23 13.3	4.011	17	17 44 46.10	2.4243	21 20 22.5	1.840
18	15 53 52.52	2.2767	20 27 10.8	3.904	18	17 47 11.61	2.4261	21 18 28.1	1.973
19	15 56 9.24	2.2807	20 31 1.8	3.796	19	17 49 37.23	2.4279	21 16 25.7	2.106
20	15 58 26.20	2.2848	20 34 46.3	3.687	20	17 52 2.95	2.4296	21 14 15.4	2.239
21	16 0 43.41	2.2888	20 38 24.2	3.577	21	17 54 28.78	2.4312	21 11 57.1	2.372
22	16 3 0.86	2.2928	20 41 55.6	3.467	22	17 56 54.70	2.4327	21 9 30.8	2.505
23	16 5 18.55	2.2967	20 45 20.3	3.357	23	17 59 20.71	2.4342	21 6 56.5	2.637
24	16 7 36.47	2.3007	S. 20 48 38.4	3.246	24	18 1 46.81	2.4357	S. 21 4 14.3	2.770

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	18 1 46.81	2.4357	S. 21 4 14.3	2.770
1	18 4 13.00	2.4371	21 1 24.1	2.904
2	18 6 39.27	2.4384	20 58 25.8	3.039
3	18 9 5.61	2.4397	20 55 19.4	3.173
4	18 11 32.03	2.4408	20 52 5.0	3.307
5	18 13 58.51	2.4419	20 48 42.6	3.440
6	18 16 25.06	2.4430	20 45 12.2	3.573
7	18 18 51.67	2.4440	20 41 33.8	3.707
8	18 21 18.34	2.4450	20 37 47.4	3.841
9	18 23 45.07	2.4459	20 33 52.9	3.975
10	18 26 11.85	2.4467	20 29 50.4	4.108
11	18 28 38.67	2.4473	20 25 39.9	4.241
12	18 31 5.53	2.4480	20 21 21.5	4.373
13	18 33 32.43	2.4487	20 16 55.1	4.507
14	18 35 59.37	2.4492	20 12 20.7	4.640
15	18 38 26.34	2.4497	20 7 38.3	4.772
16	18 40 53.34	2.4502	20 2 48.0	4.905
17	18 43 20.36	2.4506	19 57 49.7	5.037
18	18 45 47.41	2.4509	19 52 43.5	5.169
19	18 48 14.47	2.4512	19 47 29.4	5.301
20	18 50 41.55	2.4514	19 42 7.4	5.432
21	18 53 8.64	2.4515	19 36 37.5	5.563
22	18 55 35.73	2.4516	19 30 59.8	5.693
23	18 58 2.83	2.4517	S. 19 25 14.3	5.824

TUESDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	19 0 29.93	2.4517	S. 19 19 20.9	5.954
1	19 2 57.03	2.4516	19 13 19.8	6.083
2	19 5 24.12	2.4514	19 7 10.9	6.213
3	19 7 51.20	2.4513	19 0 54.2	6.342
4	19 10 18.27	2.4511	18 54 29.8	6.470
5	19 12 45.33	2.4508	18 47 57.8	6.597
6	19 15 12.37	2.4505	18 41 18.1	6.725
7	19 17 39.39	2.4501	18 34 30.8	6.852
8	19 20 6.38	2.4496	18 27 35.9	6.978
9	19 22 33.34	2.4492	18 20 33.4	7.104
10	19 25 0.28	2.4487	18 13 23.4	7.228
11	19 27 27.18	2.4481	18 6 6.0	7.352
12	19 29 54.05	2.4475	17 58 41.1	7.476
13	19 32 20.88	2.4468	17 51 8.8	7.599
14	19 34 47.67	2.4462	17 43 29.2	7.722
15	19 37 14.42	2.4454	17 35 42.2	7.845
16	19 39 41.12	2.4447	17 27 47.8	7.967
17	19 42 7.78	2.4439	17 19 46.2	8.087
18	19 44 34.39	2.4430	17 11 37.4	8.206
19	19 47 0.94	2.4421	17 3 21.5	8.324
20	19 49 27.44	2.4412	16 54 58.5	8.442
21	19 51 53.89	2.4403	16 46 28.4	8.560
22	19 54 20.28	2.4393	16 37 51.3	8.677
23	19 56 46.60	2.4382	16 29 7.2	8.793
24	19 59 12.86	2.4372	S. 16 20 16.2	8.908

WEDNESDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	19 59 12.86	2.4372	S. 16 20 16.2	8.908
1	20 1 39.06	2.4361	16 11 18.3	9.022
2	20 4 5.19	2.4350	16 2 13.6	9.134
3	20 6 31.26	2.4339	15 53 2.2	9.246
4	20 8 57.26	2.4327	15 43 44.1	9.357
5	20 11 23.19	2.4315	15 34 19.3	9.467
6	20 13 49.04	2.4303	15 24 48.0	9.576
7	20 16 14.82	2.4291	15 15 10.2	9.684
8	20 18 40.53	2.4278	15 5 25.9	9.792
9	20 21 6.16	2.4266	14 55 35.1	9.899
10	20 23 31.72	2.4253	14 45 38.0	10.003
11	20 25 57.20	2.4240	14 35 34.7	10.107
12	20 28 22.60	2.4227	14 25 25.2	10.210
13	20 30 47.92	2.4213	14 15 9.5	10.312
14	20 33 13.16	2.4200	14 4 47.8	10.412
15	20 35 38.32	2.4186	13 54 20.1	10.512
16	20 38 3.39	2.4172	13 43 46.5	10.610
17	20 40 28.38	2.4158	13 33 6.9	10.708
18	20 42 53.29	2.4144	13 22 21.5	10.804
19	20 45 18.11	2.4130	13 11 30.4	10.898
20	20 47 42.85	2.4117	13 0 33.7	10.992
21	20 50 7.51	2.4103	12 49 31.4	11.084
22	20 52 32.08	2.4088	12 38 23.6	11.175
23	20 54 56.57	2.4074	S. 12 27 10.4	11.265

THURSDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	20 57 20.97	2.4059	S. 12 15 51.8	11.353
1	20 59 45.28	2.4045	12 4 28.0	11.440
2	21 2 9.51	2.4031	11 52 59.0	11.527
3	21 4 33.65	2.4017	11 41 24.8	11.612
4	21 6 57.71	2.4002	11 29 45.6	11.695
5	21 9 21.68	2.3988	11 18 1.4	11.777
6	21 11 45.57	2.3974	11 6 12.4	11.857
7	21 14 9.37	2.3960	10 54 18.6	11.936
8	21 16 33.09	2.3946	10 42 20.1	12.014
9	21 18 56.72	2.3932	10 30 16.9	12.091
10	21 21 20.27	2.3918	10 18 9.2	12.165
11	21 23 43.74	2.3904	10 5 57.1	12.237
12	21 26 7.12	2.3890	9 53 40.7	12.309
13	21 28 30.42	2.3877	9 41 20.0	12.380
14	21 30 53.64	2.3863	9 28 55.1	12.449
15	21 33 16.78	2.3850	9 16 26.1	12.517
16	21 35 39.84	2.3837	9 3 53.1	12.583
17	21 38 2.82	2.3823	8 51 16.2	12.648
18	21 40 25.72	2.3811	8 38 35.4	12.711
19	21 42 48.55	2.3798	8 25 50.9	12.772
20	21 45 11.30	2.3785	8 13 2.8	12.832
21	21 47 33.97	2.3773	8 0 11.1	12.890
22	21 49 56.57	2.3761	7 47 16.0	12.947
23	21 52 19.10	2.3748	7 34 17.5	13.002
24	21 54 41.55	2.3736	S. 7 21 15.8	13.055

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 54 41.55	2.3736	S. 7 21 15.8	13.055
1	21 57 3.93	2.3725	7 8 10.9	13.107
2	21 59 26.25	2.3714	6 55 2.9	13.157
3	22 1 48.50	2.3703	6 41 52.0	13.206
4	22 4 10.68	2.3692	6 28 38.2	13.253
5	22 6 32.80	2.3681	6 15 21.6	13.299
6	22 8 54.85	2.3670	6 2 2.3	13.343
7	22 11 16.84	2.3660	5 48 40.4	13.386
8	22 13 38.77	2.3650	5 35 16.0	13.426
9	22 16 0.64	2.3641	5 21 49.3	13.464
10	22 18 22.46	2.3632	5 8 20.3	13.502
11	22 20 44.22	2.3622	4 54 49.1	13.538
12	22 23 5.92	2.3613	4 41 15.8	13.572
13	22 25 27.57	2.3604	4 27 40.5	13.604
14	22 27 49.17	2.3596	4 14 3.3	13.634
15	22 30 10.72	2.3587	4 0 24.4	13.662
16	22 32 32.22	2.3579	3 46 43.8	13.690
17	22 34 53.67	2.3572	3 33 1.6	13.715
18	22 37 15.08	2.3564	3 19 18.0	13.738
19	22 39 36.44	2.3557	3 5 33.0	13.761
20	22 41 57.77	2.3551	2 51 46.7	13.782
21	22 44 19.06	2.3545	2 37 59.2	13.800
22	22 46 40.31	2.3538	2 24 10.7	13.817
23	22 49 1.53	2.3533	S. 2 10 21.2	13.832

SATURDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 51 22.71	2.3527	S. 1 56 30.9	13.845
1	22 53 43.86	2.3522	1 42 39.8	13.857
2	22 56 4.98	2.3517	1 28 48.1	13.867
3	22 58 26.07	2.3512	1 14 55.8	13.875
4	23 0 47.14	2.3508	1 1 3.1	13.881
5	23 3 8.17	2.3505	0 47 10.1	13.886
6	23 5 29.19	2.3502	0 33 16.8	13.889
7	23 7 50.19	2.3498	0 19 23.4	13.890
8	23 10 11.17	2.3495	S. 0 5 30.0	13.889
9	23 12 32.13	2.3492	N. 0 8 23.3	13.887
10	23 14 53.08	2.3490	0 22 16.4	13.883
11	23 17 14.01	2.3488	0 36 9.3	13.878
12	23 19 34.93	2.3486	0 50 1.8	13.871
13	23 21 55.84	2.3485	1 3 53.8	13.862
14	23 24 16.75	2.3484	1 17 45.2	13.851
15	23 26 37.65	2.3483	1 31 35.9	13.838
16	23 28 58.55	2.3482	1 45 25.8	13.824
17	23 31 19.44	2.3482	1 59 14.8	13.807
18	23 33 40.33	2.3482	2 13 2.7	13.789
19	23 36 1.22	2.3482	2 26 49.5	13.771
20	23 38 22.12	2.3483	2 40 35.2	13.750
21	23 40 43.02	2.3484	2 54 19.5	13.727
22	23 43 3.93	2.3486	3 8 2.4	13.702
23	23 45 24.85	2.3487	3 21 43.8	13.676
24	23 47 45.77	2.3488	N. 3 35 23.5	13.648

SUNDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 47 45.77	2.3488	N. 3 35 23.5	13.648
1	23 50 6.71	2.3491	3 49 1.5	13.618
2	23 52 27.66	2.3493	4 2 37.7	13.587
3	23 54 48.63	2.3496	4 16 12.0	13.555
4	23 57 9.61	2.3499	4 29 44.3	13.521
5	23 59 30.61	2.3502	4 43 14.5	13.484
6	0 1 51.63	2.3505	4 56 42.4	13.446
7	0 4 12.67	2.3508	5 10 8.0	13.407
8	0 6 33.73	2.3512	5 23 31.2	13.367
9	0 8 54.82	2.3517	5 36 52.0	13.324
10	0 11 15.93	2.3521	5 50 10.1	13.279
11	0 13 37.07	2.3526	6 3 25.5	13.233
12	0 15 58.24	2.3530	6 16 38.1	13.186
13	0 18 19.43	2.3535	6 29 47.8	13.137
14	0 20 40.66	2.3541	6 42 54.5	13.087
15	0 23 1.92	2.3546	6 55 58.2	13.035
16	0 25 23.21	2.3552	7 8 58.7	12.981
17	0 27 44.54	2.3557	7 21 55.9	12.925
18	0 30 5.90	2.3563	7 34 49.7	12.868
19	0 32 27.30	2.3570	7 47 40.1	12.811
20	0 34 48.74	2.3576	8 0 27.0	12.751
21	0 37 10.21	2.3582	8 13 10.2	12.689
22	0 39 31.72	2.3588	8 25 49.7	12.627
23	0 41 53.27	2.3595	N. 8 38 25.4	12.563

MONDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 44 14.86	2.3602	N. 8 50 57.2	12.497
1	0 46 36.49	2.3609	9 3 25.0	12.430
2	0 48 58.17	2.3617	9 15 48.8	12.362
3	0 51 19.89	2.3623	9 28 8.4	12.292
4	0 53 41.65	2.3630	9 40 23.8	12.221
5	0 56 3.45	2.3637	9 52 34.9	12.148
6	0 58 25.30	2.3645	10 4 41.5	12.073
7	1 0 47.19	2.3652	10 16 43.6	11.998
8	1 3 9.13	2.3660	10 28 41.2	11.922
9	1 5 31.11	2.3667	10 40 34.2	11.843
10	1 7 53.14	2.3675	10 52 22.4	11.763
11	1 10 15.21	2.3683	11 4 5.8	11.683
12	1 12 37.33	2.3691	11 15 44.4	11.602
13	1 14 59.50	2.3698	11 27 18.0	11.518
14	1 17 21.71	2.3706	11 38 46.5	11.433
15	1 19 43.97	2.3713	11 50 10.0	11.348
16	1 22 6.27	2.3721	12 1 28.3	11.261
17	1 24 28.62	2.3728	12 12 41.3	11.172
18	1 26 51.01	2.3736	12 23 49.0	11.083
19	1 29 13.45	2.3743	12 34 51.3	10.992
20	1 31 35.93	2.3751	12 45 48.1	10.901
21	1 33 58.46	2.3758	12 56 39.4	10.808
22	1 36 21.03	2.3766	13 7 25.1	10.714
23	1 38 43.65	2.3773	13 18 5.1	10.619
24	1 41 6.30	2.3779	N.13 28 39.4	10.523

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 21.					**THURSDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 41 6.30	2.3779	N.13 28 39.4	10.523	0	3 35 36.35	2.3795	N.19 47 1.8	5.011
1	1 43 28.99	2.3786	13 39 7.9	10.426	1	3 37 59.09	2.3785	19 51 58.7	4.885
2	1 45 51.73	2.3793	13 49 30.5	10.327	2	3 40 21.77	2.3774	19 56 48.0	4.759
3	1 48 14.51	2.3800	13 59 47.2	10.228	3	3 42 44.38	2.3763	20 1 29.8	4.633
4	1 50 37.33	2.3807	14 9 57.9	10.128	4	3 45 6.93	2.3752	20 6 4.0	4.507
5	1 53 0.19	2.3812	14 20 2.6	10.027	5	3 47 29.41	2.3740	20 10 30.7	4.382
6	1 55 23.08	2.3818	14 30 1.2	9.925	6	3 49 51.81	2.3728	20 14 49.8	4.256
7	1 57 46.01	2.3825	14 39 53.6	9.822	7	3 52 14.14	2.3715	20 19 1.4	4.130
8	2 0 8.98	2.3831	14 49 39.8	9.718	8	3 54 36.39	2.3701	20 23 5.4	4.003
9	2 2 31.98	2.3836	14 59 19.7	9.613	9	3 56 58.55	2.3687	20 27 1.8	3.877
10	2 4 55.01	2.3841	15 8 53.3	9.507	10	3 59 20.63	2.3672	20 30 50.7	3.751
11	2 7 18.07	2.3847	15 18 20.5	9.400	11	4 1 42.62	2.3657	20 34 32.0	3.625
12	2 9 41.17	2.3852	15 27 41.3	9.292	12	4 4 4.52	2.3642	20 38 5.7	3.499
13	2 12 4.29	2.3856	15 36 55.6	9.183	13	4 6 26.32	2.3625	20 41 31.9	3.374
14	2 14 27.44	2.3861	15 46 3.3	9.074	14	4 8 48.02	2.3609	20 44 50.6	3.248
15	2 16 50.62	2.3865	15 55 4.5	8.965	15	4 11 9.63	2.3592	20 48 1.7	3.122
16	2 19 13.82	2.3868	16 3 59.1	8.854	16	4 13 31.13	2.3574	20 51 5.3	2.997
17	2 21 37.04	2.3872	16 12 47.0	8.742	17	4 15 52.52	2.3556	20 54 1.3	2.871
18	2 24 0.28	2.3875	16 21 28.1	8.629	18	4 18 13.80	2.3537	20 56 49.8	2.746
19	2 26 23.54	2.3878	16 30 2.5	8.516	19	4 20 34.96	2.3517	20 59 30.8	2.621
20	2 28 46.82	2.3881	16 38 30.1	8.402	20	4 22 56.01	2.3498	21 2 4.3	2.496
21	2 31 10.11	2.3883	16 46 50.8	8.287	21	4 25 16.94	2.3478	21 4 30.3	2.372
22	2 33 33.41	2.3885	16 55 4.6	8.172	22	4 27 37.75	2.3457	21 6 48.9	2.247
23	2 35 56.73	2.3887	N.17 3 11.5	8.057	23	4 29 58.43	2.3436	N.21 9 0.0	2.122
	WEDNESDAY 22.					**FRIDAY 24.**			
0	2 38 20.06	2.3889	N.17 11 11.4	7.940	0	4 32 18.98	2.3414	N.21 11 3.6	1.998
1	2 40 43.40	2.3890	17 19 4.3	7.823	1	4 34 39.40	2.3391	21 12 59.8	1.875
2	2 43 6.74	2.3890	17 26 50.2	7.706	2	4 36 59.68	2.3368	21 14 48.6	1.752
3	2 45 30.08	2.3890	17 34 29.0	7.588	3	4 39 19.82	2.3345	21 16 30.0	1.629
4	2 47 53.42	2.3890	17 42 0.7	7.469	4	4 41 39.82	2.3321	21 18 4.0	1.506
5	2 50 16.76	2.3889	17 49 25.3	7.350	5	4 43 59.67	2.3297	21 19 30.7	1.383
6	2 52 40 09	2.3888	17 56 42.7	7.230	6	4 46 19.38	2.3272	21 20 50.0	1.261
7	2 55 3.42	2.3887	18 3 52.9	7.110	7	4 48 38.93	2.3246	21 22 2.0	1.139
8	2 57 26.74	2.3885	18 10 55.9	6.989	8	4 50 58.33	2.3221	21 23 6.7	1.017
9	2 59 50.04	2.3882	18 17 51.6	6.868	9	4 53 17.58	2.3195	21 24 4.1	0.896
10	3 2 13.33	2.3880	18 24 40.1	6.746	10	4 55 36.67	2.3168	21 24 54.2	0.775
11	3 4 36.60	2.3877	18 31 21.2	6.624	11	4 57 55.59	2.3140	21 25 37.1	0.655
12	3 6 59.86	2.3874	18 37 55.0	6.502	12	5 0 14.35	2.3112	21 26 12.8	0.535
13	3 9 23.09	2.3870	18 44 21.4	6.379	13	5 2 32.94	2.3084	21 26 41.3	0.415
14	3 11 46.30	2.3866	18 50 40.5	6.257	14	5 4 51.36	2.3056	21 27 2.6	0.296
15	3 14 9.48	2.3861	18 56 52.2	6.133	15	5 7 9.61	2.3027	21 27 16.8	0.177
16	3 16 32.63	2.3855	19 2 56.5	6.009	16	5 9 27.68	2.2997	21 27 23.9	+ 0.059
17	3 18 55.74	2.3849	19 8 53.3	5.885	17	5 11 45.58	2.2968	21 27 23.9	− 0.058
18	3 21 18.82	2.3843	19 14 42.7	5.761	18	5 14 3.30	2.2938	21 27 16.9	0.176
19	3 23 41.86	2.3836	19 20 24.6	5.636	19	5 16 20.84	2.2907	21 27 2.8	0.292
20	3 26 4.85	2.3828	19 25 59.0	5.512	20	5 18 38.19	2.2876	21 26 41.8	0.408
21	3 28 27.80	2.3821	19 31 26.0	5.387	21	5 20 55.35	2.2844	21 26 13.8	0.525
22	3 30 50.70	2.3813	19 36 45.5	5.262	22	5 23 12.32	2.2813	21 25 38.8	0.641
23	3 33 13.55	2.3804	19 41 57.4	5.136	23	5 25 29.10	2.2781	21 24 56.9	0.755
24	3 35 36.35	2.3795	N.19 47 1.8	5.011	24	5 27 45.69	2.2748	N.21 24 8.2	0.869

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SATURDAY 25					**MONDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 27 45.69	2.2748	N.21 24 8.2	0.869	0	7 12 43.81	2.0939	N.18 42 10.4	5.627
1	5 30 2.08	2.2715	21 23 12.6	0.983	1	7 14 49.33	2.0901	18 36 30.3	5.709
2	5 32 18.27	2.2682	21 22 10.2	1.097	2	7 16 54.62	2.0862	18 30 45.3	5.791
3	5 34 34.26	2.2648	21 21 1.0	1.209	3	7 18 59.67	2.0823	18 24 55.4	5.872
4	5 36 50.05	2.2614	21 19 45.1	1.321	4	7 21 4.49	2.0784	18 19 0.7	5.952
5	5 39 5.63	2.2580	21 18 22.5	1.433	5	7 23 9.08	2.0746	18 13 1.2	6.032
6	5 41 21.01	2.2546	21 16 53.2	1.544	6	7 25 13.44	2.0707	18 6 56.9	6.111
7	5 43 36.18	2.2511	21 15 17.2	1.655	7	7 27 17.57	2.0669	18 0 47.9	6.189
8	5 45 51.14	2.2475	21 13 34.6	1.764	8	7 29 21.47	2.0631	17 54 34.2	6.267
9	5 48 5.88	2.2439	21 11 45.5	1.873	9	7 31 25.14	2.0593	17 48 15.9	6.343
10	5 50 20.41	2.2404	21 9 49.8	1.982	10	7 33 28.59	2.0556	17 41 53.0	6.419
11	5 52 34.73	2.2369	21 7 47.6	2.090	11	7 35 31.81	2.0518	17 35 25.6	6.495
12	5 54 48.84	2.2333	21 5 39.0	2.197	12	7 37 34.81	2.0481	17 28 53.6	6.571
13	5 57 2.73	2.2296	21 3 24.0	2.304	13	7 39 37.58	2.0443	17 22 17.1	6.645
14	5 59 16.39	2.2259	21 1 2.5	2.411	14	7 41 40.13	2.0407	17 15 36.2	6.718
15	6 1 29.83	2.2222	20 58 34.6	2.517	15	7 43 42.46	2.0370	17 8 51.0	6.790
16	6 3 43.05	2.2184	20 56 0.4	2.622	16	7 45 44.57	2.0333	17 2 1.4	6.862
17	6 5 56.04	2.2147	20 53 20.0	2.726	17	7 47 46.46	2.0297	16 55 7.5	6.934
18	6 8 8.81	2.2109	20 50 33.3	2.830	18	7 49 48.14	2.0262	16 48 9.3	7.005
19	6 10 21.35	2.2072	20 47 40.4	2.933	19	7 51 49.60	2.0225	16 41 6.9	7.075
20	6 12 33.67	2.2034	20 44 41.4	3.035	20	7 53 50.84	2.0189	16 34 0.3	7.144
21	6 14 45.76	2.1996	20 41 36.2	3.137	21	7 55 51.87	2.0154	16 26 49.6	7.212
22	6 16 57.63	2.1958	20 38 25.0	3.238	22	7 57 52.69	2.0119	16 19 34.8	7.281
23	6 19 9.26	2.1919	N.20 35 7.7	3.338	23	7 59 53.30	2.0084	N.16 12 15.9	7.349
	SUNDAY 26.					**TUESDAY 28.**			
0	6 21 20.66	2.1881	N.20 31 44.4	3.438	0	8 1 53.70	2.0049	N.16 4 52.9	7.416
1	6 23 31.83	2.1842	20 28 15.1	3.537	1	8 3 53.89	2.0015	15 57 26.0	7.481
2	6 25 42.77	2.1803	20 24 39.9	3.635	2	8 5 53.88	1.9981	15 49 55.2	7.546
3	6 27 53.47	2.1764	20 20 58.9	3.732	3	8 7 53.66	1.9947	15 42 20.5	7.611
4	6 30 3.94	2.1726	20 17 12.1	3.829	4	8 9 53.24	1.9914	15 34 41.9	7.675
5	6 32 14.18	2.1687	20 13 19.4	3.926	5	8 11 52.62	1.9881	15 26 59.5	7.738
6	6 34 24.18	2.1647	20 9 20.9	4.022	6	8 13 51.81	1.9848	15 19 13.3	7.801
7	6 36 33.95	2.1608	20 5 16.7	4.117	7	8 15 50.80	1.9815	15 11 23.4	7.863
8	6 38 43.48	2.1568	20 1 6.9	4.211	8	8 17 49.59	1.9782	15 3 29.8	7.924
9	6 40 52.77	2.1529	19 56 51.4	4.305	9	8 19 48.18	1.9749	14 55 32.5	7.985
10	6 43 1.83	2.1490	19 52 30.3	4.398	10	8 21 46.58	1.9718	14 47 31.6	8.045
11	6 45 10.65	2.1450	19 48 3.7	4.490	11	8 23 44.80	1.9687	14 39 27.1	8.104
12	6 47 19.23	2.1411	19 43 31.5	4.582	12	8 25 42.83	1.9656	14 31 19.1	8.163
13	6 49 27.58	2.1372	19 38 53.8	4.673	13	8 27 40.67	1.9625	14 23 7.6	8.221
14	6 51 35.69	2.1332	19 34 10.7	4.763	14	8 29 38.33	1.9595	14 14 52.6	8.278
15	6 53 43.56	2.1292	19 29 22.3	4.852	15	8 31 35.81	1.9565	14 6 34.2	8.335
16	6 55 51.20	2.1253	19 24 28.5	4.941	16	8 33 33.11	1.9535	13 58 12.4	8.391
17	6 57 58.60	2.1214	19 19 29.4	5.029	17	8 35 30.23	1.9505	13 49 47.3	8.447
18	7 0 5.77	2.1175	19 14 25.0	5.117	18	8 37 27.17	1.9476	13 41 18.8	8.502
19	7 2 12.70	2.1135	19 9 15.3	5.204	19	8 39 23.94	1.9447	13 32 47.0	8.556
20	7 4 19.39	2.1096	19 4 0.5	5.289	20	8 41 20.54	1.9419	13 24 12.1	8.609
21	7 6 25.85	2.1057	18 58 40.6	5.374	21	8 43 16.97	1.9391	13 15 34.0	8.662
22	7 8 32.07	2.1017	18 53 15.6	5.459	22	8 45 13.23	1.9363	13 6 52.7	8.714
23	7 10 38.06	2.0978	18 47 45.5	5.543	23	8 47 9.33	1.9336	12 58 8.3	8.766
24	7 12 43.81	2.0939	N.18 42 10.4	5.627	24	8 49 5.26	1.9308	N.12 49 20.8	8.817

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	8 49 5.26	1.9308	N. 12 49 20.8	8.817
1	8 51 1.03	1.9282	12 40 30.2	8.867
2	8 52 56.65	1.9257	12 31 36.7	8.917
3	8 54 52.11	1.9231	12 22 40.2	8.966
4	8 56 47.42	1.9205	12 13 40.8	9.014
5	8 58 42.57	1.9179	12 4 38.5	9.062
6	9 0 37.57	1.9155	11 55 33.3	9.110
7	9 2 32.43	1.9131	11 46 25.3	9.156
8	9 4 27.15	1.9108	11 37 14.6	9.202
9	9 6 21.72	1.9084	11 28 1.1	9.247
10	9 8 16.15	1.9061	11 18 44.9	9.292
11	9 10 10.45	1.9038	11 9 26.0	9.337
12	9 12 4.61	1.9016	11 0 4.5	9.380
13	9 13 58.64	1.8994	10 50 40.4	9.424
14	9 15 52.54	1.8972	10 41 13.8	9.465
15	9 17 46.31	1.8952	10 31 44.6	9.507
16	9 19 39.96	1.8932	10 22 13.0	9.548
17	9 21 33.49	1.8912	10 12 38.9	9.588
18	9 23 26.90	1.8892	10 3 2.4	9.628
19	9 25 20.19	1.8872	9 53 23.5	9.667
20	9 27 13.37	1.8853	9 43 42.3	9.706
21	9 29 6.43	1.8834	9 33 58.8	9.744
22	9 30 59.38	1.8817	9 24 13.0	9.782
23	9 32 52.23	1.8799	N. 9 14 25.0	9.818

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 34 44.97	1.8782	N. 9 4 34.9	9.853
1	9 36 37.61	1.8765	8 54 42.6	9.889
2	9 38 30.15	1.8749	8 44 48.2	9.924
3	9 40 22.60	1.8733	8 34 51.7	9.959
4	9 42 14.95	1.8717	8 24 53.1	9.992
5	9 44 7.21	1.8703	8 14 52.6	10.025
6	9 45 59.39	1.8689	8 4 50.1	10.058
7	9 47 51.48	1.8675	7 54 45.6	10.090
8	9 49 43.49	1.8661	7 44 39.3	10.121
9	9 51 35.41	1.8647	7 34 31.1	10.152
10	9 53 27.25	1.8634	7 24 21.1	10.182
11	9 55 19.02	1.8622	7 14 9.3	10.212
12	9 57 10.72	1.8611	7 3 55.7	10.241
13	9 59 2.35	1.8599	6 53 40.4	10.268
14	10 0 53.91	1.8588	6 43 23.5	10.296
15	10 2 45.41	1.8577	6 33 4.9	10.323
16	10 4 36.84	1.8567	6 22 44.7	10.350
17	10 6 28.22	1.8558	6 12 22.9	10.376
18	10 8 19.54	1.8549	6 1 59.6	10.401
19	10 10 10.81	1.8541	5 51 34.8	10.425
20	10 12 2.03	1.8533	5 41 8.6	10.449
21	10 13 53.20	1.8525	5 30 40.9	10.472
22	10 15 44.33	1.8517	5 20 11.9	10.495
23	10 17 35.41	1.8510	5 9 41.5	10.517
24	10 19 26.45	1.8504	N. 4 59 9.8	10.539

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 19 26.45	1.8504	N. 4 59 9.8	10.539
1	10 21 17.46	1.8498	4 48 36.8	10.560
2	10 23 8.43	1.8492	4 38 2.6	10.580
3	10 24 59.37	1.8487	4 27 27.2	10.600
4	10 26 50.28	1.8483	4 16 50.6	10.619
5	10 28 41.17	1.8480	4 6 12.9	10.637
6	10 30 32.04	1.8477	3 55 34.1	10.655
7	10 32 22.89	1.8473	3 44 54.3	10.672
8	10 34 13.72	1.8470	3 34 13.4	10.690
9	10 36 4.53	1.8468	3 23 31.5	10.707
10	10 37 55.33	1.8467	3 12 48.6	10.722
11	10 39 46.13	1.8466	3 2 4.9	10.736
12	10 41 36.91	1.8464	2 51 20.3	10.750
13	10 43 27.70	1.8464	2 40 34.9	10.763
14	10 45 18.49	1.8465	2 29 48.7	10.777
15	10 47 9.28	1.8466	2 19 1.7	10.789
16	10 49 0.08	1.8467	2 8 14.0	10.801
17	10 50 50.88	1.8468	1 57 25.6	10.812
18	10 52 41.69	1.8470	1 46 36.6	10.822
19	10 54 32.52	1.8473	1 35 47.0	10.832
20	10 56 23.37	1.8476	1 24 56.8	10.841
21	10 58 14.23	1.8479	1 14 6.1	10.849
22	11 0 5.12	1.8483	1 3 14.9	10.857
23	11 1 56.03	1.8487	N. 0 52 23.3	10.864

SATURDAY, APRIL 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 3 46.97	1.8492	N. 0 41 31.2	10.871

PHASES OF THE MOON.

	d	h	m
○ Full Moon	4	12	39.7
☾ Last Quarter	12	9	28.2
● New Moon	19	0	17.7
☽ First Quarter . . .	26	1	33.0

	d	h
☾ Apogee.	2	23.1
☾ Perigee.	18	0.3
☾ Apogee.	30	9.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Saturn	W.	84° 14′ 48″	3104	85° 42′ 53″	3107	87° 10′ 54″	3110	88° 38′ 52″	3112
	Jupiter	W.	72 16 21	3116	73 44 11	3119	75 11 58	3121	76 39 42	3124
	Aldebaran	W.	54 7 12	3085	55 35 40	3087	57 4 6	3088	58 32 30	3090
	Mars	W.	32 23 3	3220	33 48 48	3219	35 14 35	3217	36 40 24	3216
	Spica	E.	79 37 12	3060	78 8 14	3063	76 39 19	3065	75 10 27	3068
2	Saturn	W.	95 58 6	3119	97 25 52	3120	98 53 37	3121	100 21 21	3121
	Jupiter	W.	83 57 45	3132	85 25 16	3132	86 52 47	3133	88 20 17	3133
	Aldebaran	W.	65 54 8	3094	67 22 25	3095	68 50 41	3095	70 18 57	3094
	Mars	W.	43 49 39	3214	45 15 32	3213	46 41 26	3212	48 7 21	3212
	Pollux	W.	25 23 56	3472	26 44 51	3435	28 6 28	3402	29 28 42	3374
	Spica	E.	67 46 44	3075	66 18 4	3076	64 49 25	3076	63 20 46	3077
3	Jupiter	W.	95 37 43	3132	97 5 14	3131	98 32 46	3130	100 0 19	3129
	Aldebaran	W.	77 40 24	3091	79 8 44	3091	80 37 5	3089	82 5 28	3087
	Mars	W.	55 17 10	3206	56 43 12	3204	58 9 16	3203	59 35 22	3202
	Pollux	W.	36 26 45	3276	37 51 24	3262	39 16 20	3250	40 41 30	3238
	Spica	E.	55 57 36	3076	54 28 57	3074	53 0 16	3073	51 31 34	3072
	Antares	E.	101 26 9	3091	99 57 48	3090	98 20 26	3088	97 1 2	3087
4	Aldebaran	W.	89 27 52	3078	90 56 28	3077	92 25 6	3074	93 53 47	3071
	Mars	W.	66 46 21	3191	68 12 41	3189	69 39 3	3187	71 5 28	3183
	Pollux	W.	47 50 28	3191	49 16 48	3183	50 43 17	3176	52 9 55	3169
	Spica	E.	44 7 38	3064	42 38 44	3062	41 9 48	3060	39 40 49	3057
	Antares	E.	89 38 36	3078	88 9 59	3076	86 41 20	3073	85 12 38	3071
5	Mars	W.	78 18 25	3169	79 45 11	3165	81 12 2	3162	82 38 57	3158
	Pollux	W.	59 25 8	3136	60 52 34	3129	62 20 8	3124	63 47 49	3117
	Regulus	W.	22 24 24	3170	23 51 9	3152	25 18 16	3136	26 45 42	3123
	Spica	E.	32 15 6	3043	30 45 47	3040	29 16 24	3037	27 46 57	3033
	Antares	E.	77 48 20	3057	76 19 18	3053	74 50 11	3050	73 21 0	3047
6	Mars	W.	89 54 41	3138	91 22 4	3133	92 49 33	3129	94 17 8	3124
	Pollux	W.	71 8 4	3088	72 36 28	3082	74 5 0	3076	75 33 39	3069
	Regulus	W.	34 6 34	3069	35 35 22	3059	37 4 22	3051	38 33 32	3043
	Antares	E.	65 54 0	3028	64 24 22	3023	62 54 38	3019	61 24 49	3015
7	Pollux	W.	82 58 47	3039	84 28 12	3033	85 57 44	3026	87 27 24	3020
	Regulus	W.	46 1 51	3003	47 32 0	2995	49 2 19	2987	50 32 48	2980
	Antares	E.	53 54 21	2991	52 23 57	2987	50 53 28	2982	49 22 53	2977
8	Pollux	W.	94 57 49	2985	96 28 20	2978	97 59 0	2971	99 29 49	2965
	Regulus	W.	58 7 39	2939	59 39 8	2931	61 10 48	2922	62 42 39	2914
	Antares	E.	41 48 19	2951	40 17 5	2946	38 45 45	2942	37 14 19	2936
	α Aquilæ	E.	94 49 33	3343	93 26 11	3334	92 2 39	3325	90 38 57	3317
9	Regulus	W.	70 24 40	2868	71 57 40	2858	73 30 53	2848	75 4 19	2838
	Spica	W.	16 21 51	2857	17 55 5	2845	19 28 34	2835	21 2 17	2824
	Antares	E.	29 35 44	2919	28 3 49	2917	26 31 52	2917	24 59 55	2918
	α Aquilæ	E.	83 38 8	3280	82 13 33	3274	80 48 51	3269	79 24 3	3264
	Sun	E.	130 13 33	3236	128 48 7	3225	127 22 27	3213	125 56 33	3202
10	Regulus	W.	82 54 50	2784	84 29 39	2773	86 4 42	2761	87 40 1	2749

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Saturn	W.	90° 6′ 47″	3114	91° 34′ 39″	3116	93° 2′ 29″	3117	94° 30′ 18″	3118
	Jupiter	W.	78 7 23	3125	79 35 2	2127	81 2 39	3129	82 30 13	3131
	Aldebaran	W.	60 0 52	3091	61 29 13	3092	62 57 32	3093	64 25 50	3093
	Mars	W.	38 6 14	3216	39 32 4	3215	40 57 55	3214	42 23 47	3214
	Spica	E.	73 41 38	3069	72 12 51	3072	70 44 7	3073	69 15 25	3074
2	Saturn	W.	101 49 5	3121	103 16 49	3122	104 44 32	3122	106 12 15	3121
	Jupiter	W.	89 47 46	3133	91 15 15	3133	92 42 44	3133	94 10 13	3133
	Aldebaran	W.	71 47 14	3094	73 15 31	3094	74 43 48	3093	76 12 6	3093
	Mars	W.	49 33 16	3211	50 59 12	3209	52 25 10	3209	53 51 9	3207
	Pollux	W.	30 51 28	3350	32 14 42	3328	33 38 21	3308	35 2 23	3291
	Spica	E.	61 52 8	3077	60 23 30	3077	58 54 52	3077	57 26 14	3077
3	Jupiter	W.	101 27 53	3128	102 55 29	3126	104 23 7	3124	105 50 47	3123
	Aldebaran	W.	83 33 53	3086	85 2 20	3085	86 30 48	3082	87 59 19	3081
	Mars	W.	61 1 29	3200	62 27 38	3198	63 53 50	3196	65 20 4	3193
	Pollux	W.	42 6 54	3227	43 32 31	3218	44 58 19	3209	46 24 18	3199
	Spica	E.	50 2 50	3071	48 34 5	3069	47 5 18	3068	45 36 29	3066
	Antares	E.	95 32 37	3086	94 4 10	3084	92 35 41	3082	91 7 10	3080
4	Aldebaran	W.	95 22 32	3069	96 51 20	3066	98 20 11	3063	99 49 6	3060
	Mars	W.	72 31 57	3181	73 58 29	3178	75 25 4	3175	76 51 43	3173
	Pollux	W.	53 36 41	3162	55 3 36	3155	56 30 39	3148	57 57 50	3143
	Spica	E.	38 11 47	3055	36 42 42	3052	35 13 33	3049	33 44 21	3047
	Antares	E.	83 43 53	3069	82 15 5	3065	80 46 13	3063	79 17 18	3060
5	Mars	W.	84 5 57	3154	85 33 1	3150	87 0 10	3147	88 27 23	3143
	Pollux	W.	65 15 38	3111	66 43 34	3105	68 11 37	3100	69 39 47	3794
	Regulus	W.	28 13 24	3110	29 41 22	3098	31 9 34	3088	32 37 58	3078
	Spica	E.	26 17 25	3030	24 47 49	3026	23 18 9	3023	21 48 25	3020
	Antares	E.	71 51 45	3043	70 22 26	3039	68 53 2	3035	67 23 33	3032
6	Mars	W.	95 44 48	3119	97 12 34	3114	98 40 26	3109	100 8 25	3104
	Pollux	W.	77 2 26	3064	78 31 20	3058	80 0 21	3052	81 29 30	3045
	Regulus	W.	40 2 52	3034	41 32 22	3026	43 2 2	3018	44 31 52	3011
	Antares	E.	59 54 55	3010	58 24 55	3006	56 54 50	3001	55 24 39	2996
7	Pollux	W.	88 57 12	3014	90 27 8	3006	91 57 13	2999	93 27 27	2993
	Regulus	W.	52 3 26	2972	53 34 14	2964	55 5 12	2956	56 36 20	2947
	Antares	E.	47 52 11	2972	46 21 23	2966	44 50 28	2962	43 19 27	2956
8	Pollux	W.	101 0 46	2957	102 31 53	2950	104 3 9	2942	105 34 35	2934
	Regulus	W.	64 14 40	2905	65 46 52	2896	67 19 16	2887	68 51 52	2877
	Antares	E.	35 42 46	2932	34 11 8	2927	32 39 24	2924	31 7 36	2921
	α Aquilæ	E.	89 15 5	3309	87 51 4	3301	86 26 54	3294	85 2 35	3287
9	Regulus	W.	76 37 58	2828	78 11 50	2817	79 45 56	2806	81 20 16	2795
	Spica	W.	22 36 14	2813	24 10 25	2801	25 44 51	2791	27 19 31	2770
	Antares	E.	23 27 59	2920	21 56 8	2928	20 24 25	2939	18 52 56	2956
	α Aquilæ	E.	77 59 9	3259	76 34 9	3253	75 9 3	3250	73 43 53	3247
	Sun	E.	124 30 26	3190	123 4 5	3178	121 37 29	3166	120 10 39	3153
10	Regulus	W.	89 15 36	2737	90 51 27	2725	92 27 34	2712	94 3 58	2700

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	Spica	W.	28° 54′ 26″	2768	30° 29′ 36″	2756	32° 5′ 2″	2744	33° 40′ 43″	2732
	α Aquilæ	E.	72 18 39	3244	70 53 22	3242	69 28 2	3241	68 2 41	3241
	Sun	E.	118 43 33	3140	117 16 12	3128	115 48 36	3114	114 20 44	3101
11	Regulus	W.	95 40 38	2687	97 17 35	2674	98 54 50	2660	100 32 23	2646
	Spica	W.	41 43 15	2669	43 20 37	2655	44 58 17	2641	46 36 16	2628
	α Aquilæ	E.	60 56 12	3253	59 31 6	3260	58 6 8	3269	56 41 20	3280
	Sun	E.	106 57 15	3031	105 27 41	3017	103 57 49	3001	102 27 38	2987
12	Spica	W.	54 50 53	2556	56 30 48	2541	58 11 4	2526	59 51 41	2512
	α Aquilæ	E.	49 41 22	3372	48 18 33	3400	46 56 17	3434	45 34 39	3473
	Sun	E.	94 51 58	2909	93 19 50	2893	91 47 22	2876	90 14 33	2860
13	Spica	W.	68 20 4	2434	70 2 50	2418	71 45 59	2403	73 29 30	2387
	Antares	W.	23 19 45	2536	25 0 8	2507	26 41 11	2481	28 22 51	2456
	Sun	E.	82 25 7	2777	80 50 9	2760	79 14 48	2743	77 39 5	2725
14	Spica	W.	82 12 48	2308	83 58 36	2293	85 44 46	2277	87 31 19	2262
	Antares	W.	36 59 12	2353	38 43 55	2333	40 29 6	2315	42 14 43	2297
	Sun	E.	69 34 53	2643	67 56 56	2626	66 18 36	2610	64 39 54	2594
15	Spica	W.	96 29 36	2189	98 18 20	2175	100 7 25	2162	101 56 50	2149
	Antares	W.	51 9 10	2215	52 57 15	2200	54 45 42	2186	56 34 31	2172
	Sun	E.	56 21 6	2518	54 40 18	2504	52 59 11	2491	51 17 45	2478
16	Spica	W.	111 8 41	2090	112 59 56	2079	114 51 27	2069	116 43 14	2060
	Antares	W.	65 43 42	2108	67 34 29	2098	69 25 32	2088	71 16 50	2078
	Sun	E.	42 46 15	2422	41 3 11	2412	39 19 54	2405	37 36 26	2397
17	Antares	W.	80 36 49	2038	82 29 24	2032	84 22 8	2028	86 14 59	2024
	α Aquilæ	W.	36 0 42	3529	37 20 34	3396	38 42 55	3280	40 7 30	3178
	Sun	E.	28 57 1	2380	27 12 57	2382	25 28 56	2386	23 45 1	2394
21	Sun	W.	27 39 24	2565	29 19 7	2576	30 58 35	2588	32 37 46	2601
	Aldebaran	E.	40 38 13	2235	38 50 37	2254	37 3 30	2274	35 16 52	2295
	Mars	E.	69 7 45	2339	67 22 42	2355	65 38 3	2373	63 53 49	2391
	Pollux	E.	83 0 53	2272	81 14 12	2288	79 27 55	2306	77 42 4	2324
22	Sun	W.	40 48 42	2682	42 25 46	2699	44 2 27	2717	45 38 44	2736
	Mars	E.	55 19 18	2487	53 37 47	2507	51 56 44	2528	50 16 10	2549
	Pollux	E.	68 59 26	2419	67 16 18	2440	65 33 40	2460	63 51 31	2482
	Regulus	E.	105 37 18	2354	103 52 37	2372	102 8 22	2390	100 24 33	2409
23	Sun	W.	53 33 54	2832	55 7 40	2852	56 41 1	2871	58 13 57	2891
	α Arietis	W.	22 19 53	2754	23 55 21	2739	25 31 9	2730	27 7 9	2726
	Mars	E.	42 0 42	2659	40 23 7	2682	38 46 3	2706	37 9 31	2729
	Pollux	E.	55 28 24	2595	53 49 22	2618	52 10 52	2643	50 32 55	2668
	Regulus	E.	91 52 5	2502	90 10 55	2521	88 30 11	2540	86 49 53	2559
24	Sun	W.	65 52 23	2988	67 22 51	3007	68 52 55	3026	70 22 36	3045
	α Arietis	W.	35 7 3	2749	36 42 38	2758	38 18 1	2768	39 53 11	2779
	Saturn	W.	29 15 25	2710	30 51 52	2724	32 28 0	2739	34 3 48	2754
	Jupiter	W.	15 32 16	2709	17 8 44	2725	18 44 51	2741	20 20 36	2758

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	Spica	W.	35° 16′ 40″	2719	36° 52′ 54″	2707	38° 29′ 24″	2695	40° 6′ 11″	2682
	α Aquilæ	E.	66 37 20	3241	65 11 59	3242	63 46 40	3245	62 21 24	3248
	Sun	E.	112 52 36	3088	111 24 12	3074	109 55 31	3060	108 26 32	3045
11	Regulus	W.	102 10 15	2633	103 48 25	2620	105 26 53	2606	107 5 40	2592
	Spica	W.	48 14 33	2614	49 53 9	2600	51 32 4	2586	53 11 18	2571
	α Aquilæ	E.	55 16 45	3293	53 52 25	3307	52 28 22	3325	51 4 40	3346
	Sun	E.	100 57 9	2972	99 26 21	2956	97 55 13	2941	96 23 46	2924
12	Spica	W.	61 32 38	2497	63 13 56	2481	64 55 36	2465	66 37 39	2449
	α Aquilæ	E.	44 13 45	3519	42 53 42	3571	41 34 36	3632	40 16 36	3703
	Sun	E.	88 41 23	2843	87 7 51	2827	85 33 58	2810	83 59 43	2794
13	Spica	W.	75 13 24	2371	76 57 41	2355	78 42 21	2339	80 27 23	2324
	Antares	W.	30 5 6	2433	31 47 53	2412	33 31 10	2391	35 14 57	2372
	Sun	E.	76 2 59	2709	74 26 31	2692	72 49 41	2675	71 12 28	2659
14	Spica	W.	89 18 14	2247	91 5 31	2231	92 53 11	2217	94 41 13	2203
	Antares	W.	44 0 47	2280	45 47 16	2263	47 34 10	2247	49 21 28	2231
	Sun	E.	63 0 51	2579	61 21 27	2563	59 41 41	2548	58 1 34	2533
15	Spica	W.	103 46 35	2136	105 36 39	2124	107 27 2	2112	109 17 43	2101
	Antares	W.	58 23 41	3158	60 13 12	2145	62 3 3	2132	63 53 13	2120
	Sun	E.	49 36 1	2465	47 53 59	2453	46 11 40	2442	44 29 5	2431
16	Spica	W.	118 35 15	2051	120 27 30	2043	122 19 57	2035	124 12 36	2029
	Antares	W.	73 8 23	2068	75 0 11	2060	76 52 12	2052	78 44 25	2045
	Sun	E.	35 52 47	2391	34 8 59	2386	32 25 4	2382	30 41 4	2380
17	Antares	W.	88 7 56	2020	90 0 59	2017	91 54 7	2015	93 47 18	2014
	α Aquilæ	W.	41 34 5	3090	43 2 27	3013	44 32 24	2944	46 3 47	2883
	Sun	E.	22 1 17	2405	20 17 49	2420	18 34 43	2443	16 52 10	2476
21	Sun	W.	34 16 39	2616	35 55 12	2632	37 33 24	2648	39 11 14	2664
	Aldebaran	E.	33 30 45	2317	31 45 10	2339	30 0 8	2363	28 15 40	2389
	Mars	E.	62 10 1	2409	60 26 39	2428	58 43 44	2448	57 1 17	2467
	Pollux	E.	75 56 39	2342	74 11 40	2360	72 27 8	2379	70 43 3	2398
22	Sun	W.	47 14 36	2755	48 50 3	2774	50 25 5	2793	51 59 42	2812
	Mars	E.	48 36 5	2571	46 56 30	2592	45 17 24	2614	43 38 48	2636
	Pollux	E.	62 9 52	2503	60 28 43	2525	58 48 5	2548	57 7 59	2571
	Regulus	E.	98 41 11	2427	96 58 15	2445	95 15 45	2465	93 33 42	2483
23	Sun	W.	59 46 28	2910	61 18 34	2930	62 50 15	2950	64 21 31	2969
	α Arietis	W.	28 43 14	2725	30 19 20	2729	31 55 22	2734	33 31 17	2741
	Mars	E.	35 33 30	2754	33 58 2	2779	32 23 7	2805	30 48 45	2831
	Pollux	E.	48 55 32	2693	47 18 43	2719	45 42 29	2747	44 6 51	2774
	Regulus	E.	85 10 1	2577	83 30 35	2596	81 51 35	2615	80 13 1	2634
24	Sun	W.	71 51 53	3063	73 20 48	3081	74 49 21	3099	76 17 32	3117
	α Arietis	W.	41 28 7	2790	43 2 48	2802	44 37 13	2814	46 11 23	2827
	Saturn	W.	35 39 16	2769	37 14 24	2784	38 49 13	2799	40 23 42	2815
	Jupiter	W.	21 55 59	2774	23 31 1	2791	25 5 41	2807	26 40 0	2822

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
24	Mars	E.	29° 14′ 57″	2859	27° 41′ 45″	2888	26° 9′ 11″	2919	24° 37′ 16″	2951
	Pollux	E.	42 31 49	2803	40 57 25	2832	39 23 39	2863	37 50 33	2896
	Regulus	E.	78 34 52	2652	76 57 8	2670	75 19 48	2689	73 42 53	2707
25	Sun	W.	77 45 21	3134	79 12 49	3151	80 39 57	3168	82 6 45	3183
	α Arietis	W.	47 45 16	2839	49 18 53	2852	50 52 14	2864	52 25 19	2877
	Saturn	W.	41 57 51	2829	43 31 41	2844	45 5 12	2859	46 38 24	2873
	Jupiter	W.	28 13 59	2838	29 47 37	2855	31 20 54	2869	32 53 52	2884
	Regulus	E.	65 44 9	2793	64 9 32	2809	62 35 16	2826	61 1 22	2842
26	Sun	W.	89 16 4	3259	90 41 3	3273	92 5 46	3287	93 30 13	3300
	α Arietis	W.	60 6 46	2936	61 38 19	2948	63 9 37	2959	64 40 41	2969
	Saturn	W.	54 19 58	2940	55 51 26	2952	57 22 39	2965	58 53 36	2976
	Jupiter	W.	40 34 1	2955	42 5 10	2968	43 36 3	2981	45 6 40	2993
	Aldebaran	W.	26 54 49	2958	28 25 55	2964	29 56 53	2970	31 27 43	2977
	Regulus	E.	53 16 51	2917	51 44 54	2931	50 13 15	2945	48 41 53	2959
27	Sun	W.	100 28 55	3358	101 52 0	3368	103 14 53	3378	104 37 35	3386
	α Arietis	W.	72 12 48	3019	73 42 37	3027	75 12 16	3036	76 41 44	3043
	Saturn	W.	66 24 56	3028	67 54 34	3038	69 24 0	3046	70 53 16	3055
	Jupiter	W.	52 36 11	3047	54 5 26	3056	55 34 29	3065	57 3 21	3073
	Aldebaran	W.	38 59 38	3014	40 29 34	3021	41 59 21	3027	43 29 0	3034
	Regulus	E.	41 9 18	3024	39 39 35	3037	38 10 8	3050	36 40 57	3062
	Spica	E.	94 50 7	2976	93 19 24	2985	91 48 53	2994	90 18 33	3003
28	Sun	W.	111 28 40	3426	112 50 27	3432	114 12 7	3438	115 33 40	3444
	Saturn	W.	78 17 9	3090	79 45 31	3096	81 13 46	3101	82 41 54	3105
	Jupiter	W.	64 25 15	3110	65 53 12	3116	67 21 2	3122	68 48 45	3126
	Aldebaran	W.	50 55 18	3063	52 24 13	3068	53 53 2	3072	55 21 46	3077
	Regulus	E.	29 18 54	3129	27 51 19	3143	26 24 2	3160	24 57 5	3178
	Spica	E.	82 49 21	3039	81 19 56	3044	79 50 38	3050	78 21 27	3055
29	Sun	W.	122 20 2	3465	123 41 5	3469	125 2 4	3471	126 23 1	3473
	Saturn	W.	90 1 16	3124	91 28 56	3127	92 56 33	3129	94 24 7	3131
	Jupiter	W.	76 6 2	3146	77 33 16	3148	79 0 27	3150	80 27 36	3152
	Aldebaran	W.	62 44 17	3091	64 12 37	3094	65 40 54	3095	67 9 10	3096
	Mars	W.	31 12 8	3306	32 36 13	3303	34 0 21	3300	35 24 32	3298
	Pollux	W.	22 38 56	3601	23 57 29	3545	25 17 3	3498	26 37 29	3458
	Spica	E.	70 56 51	3073	69 28 9	3076	67 59 30	3078	66 30 53	3079
30	Jupiter	W.	87 42 58	3154	89 10 2	3154	90 37 6	3154	92 4 10	3153
	Aldebaran	W.	74 30 13	3098	75 58 25	3097	77 26 38	3096	78 54 53	3094
	Mars	W.	42 26 9	3286	43 50 37	3284	45 15 7	3282	46 39 40	3278
	Pollux	W.	33 28 58	3327	34 52 38	3310	36 16 38	3293	37 40 58	3278
	Spica	E.	59 8 11	3082	57 39 40	3082	56 11 8	3081	54 42 35	3080
	Antares	E.	104 35 11	3100	103 7 1	3099	101 38 50	3098	100 10 38	3097
31	Jupiter	W.	99 19 59	3143	100 47 17	3140	102 14 38	3137	103 42 3	3133
	Aldebaran	W.	86 16 37	3084	87 45 6	3081	89 13 39	3078	90 42 16	3074
	Mars	W.	53 43 21	3262	55 8 17	3258	56 33 18	3253	57 58 24	3249
	Pollux	W.	44 46 33	3218	46 12 21	3208	47 38 21	3198	49 4 32	3189
	Spica	E.	47 19 25	3070	45 50 39	3067	44 21 49	3064	42 52 55	3061
	Antares	E.	92 49 8	3087	91 20 42	3083	89 52 12	3080	88 23 38	3077

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
24	Mars	E.	23° 6′ 2″	2987	21° 35′ 33″	3027	20° 5′ 54″	3072	18° 37′ 10″	3193
	Pollux	E.	36 18 9	2930	34 46 28	2666	33 15 33	3005	31 45 27	3047
	Regulus	E.	72 6 22	2724	70 30 14	2742	68 54 30	2759	67 19 8	2776
25	Sun	W.	83 33 14	3199	84 59 24	3215	86 25 15	3231	87 50 48	3245
	α Arietis	W.	53 58 7	2890	55 30 39	2901	57 2 56	2913	58 34 58	2924
	Saturn	W.	48 11 18	2887	49 43 54	2901	51 16 12	2914	52 48 13	2927
	Jupiter	W.	34 26 31	2899	35 58 51	2914	37 30 52	2928	39 2 35	2942
	Regulus	E.	59 27 48	2857	57 54 34	2873	56 21 40	2888	54 49 6	2903
26	Sun	W.	94 54 25	3312	96 18 23	3324	97 42 7	3335	99 5 38	3347
	α Arietis	W.	66 11 32	2980	67 42 10	2990	69 12 35	3000	70 42 48	3010
	Saturn	W.	60 24 19	2987	61 54 48	2998	63 25 3	3008	64 55 6	3018
	Jupiter	W.	46 37 2	3004	48 7 10	3015	49 37 4	3026	51 6 44	3037
	Aldebaran	W.	32 58 24	2985	34 28 56	2992	35 59 19	2999	37 29 33	3006
	Regulus	E.	47 10 49	2973	45 40 2	2965	44 9 31	2999	42 39 17	3011
27	Sun	W.	106 0 7	3395	107 22 29	3404	108 44 41	3411	110 6 45	3410
	α Arietis	W.	78 11 3	3051	79 40 13	3058	81 9 14	3065	82 38 6	3072
	Saturn	W.	72 22 21	3063	73 51 16	3070	75 20 2	3078	76 48 39	3083
	Jupiter	W.	58 32 3	3082	60 0 35	3090	61 28 57	3097	62 57 10	3104
	Aldebaran	W.	44 58 31	3040	46 27 54	3047	47 57 9	3052	49 26 17	3058
	Regulus	E.	35 12 1	3075	33 43 21	3087	32 14 56	3101	30 46 47	3114
	Spica	E.	88 48 24	3011	87 18 25	3018	85 48 35	3026	84 18 54	3032
28	Sun	W.	116 55 7	3449	118 16 28	3454	119 37 44	3458	120 58 55	3462
	Saturn	W.	84 9 57	3110	85 37 54	3114	87 5 46	3119	88 33 33	3122
	Jupiter	W.	70 16 23	3131	71 43 55	3135	73 11 22	3139	74 38 44	3143
	Aldebaran	W.	56 50 24	3080	58 18 58	3083	59 47 28	3087	61 15 54	3089
	Regulus	E.	23 30 30	3198	22 4 19	3222	20 38 36	3249	19 13 25	3281
	Spica	E.	76 52 22	3059	75 23 22	3063	73 54 27	3067	72 25 37	3070
29	Sun	W.	127 43 55	3475	129 4 47	3477	130 25 37	3478	131 46 26	3479
	Saturn	W.	95 51 39	3133	97 19 9	3133	98 46 38	3133	100 14 7	3133
	Jupiter	W.	81 54 43	3153	83 21 48	3154	84 48 52	3155	86 15 55	3155
	Aldebaran	W.	68 37 24	3097	70 5 37	3098	71 33 49	3098	73 2 1	3098
	Mars	W.	36 48 46	3295	38 13 3	3294	39 37 22	3291	41 1 44	3288
	Pollux	W.	27 58 40	3424	29 20 29	3396	30 42 50	3370	32 5 41	3347
	Spica	E.	65 2 18	3081	63 33 45	3082	62 5 13	3082	60 36 42	3082
30	Jupiter	W.	93 31 15	3152	94 58 22	3149	96 25 32	3148	97 52 44	3145
	Aldebaran	W.	80 23 10	3093	81 51 28	3091	83 19 48	3089	84 48 11	3087
	Mars	W.	48 4 17	3276	49 28 57	3272	50 53 41	3269	52 18 29	3265
	Pollux	W.	39 5 35	3265	40 30 28	3252	41 55 36	3240	43 20 58	3229
	Spica	E.	53 14 1	3078	51 45 25	3078	50 16 48	3075	48 48 8	3073
	Antares	E.	98 42 25	3096	97 14 10	3093	95 45 52	3091	94 17 31	3089
31	Jupiter	W.	105 9 33	3129	106 37 7	3125	108 4 46	3121	109 32 30	3117
	Aldebaran	W.	92 10 57	3070	93 39 43	3067	95 8 33	3063	96 37 28	3059
	Mars	W.	59 23 35	3945	60 48 51	3940	62 14 13	3936	63 39 40	3931
	Pollux	W.	50 30 54	3180	51 57 27	3171	53 24 11	3163	54 51 5	3153
	Spica	E.	41 23 58	3057	39 54 56	3054	38 25 50	3050	36 56 39	3045
	Antares	E.	86 55 0	3073	85 26 17	3069	83 57 30	3065	82 28 38	3061

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.		Subtracted from Apparent Time.	
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	0 42 53.03	9.096	N. 4 36 50.6	+57.78	16 2.08	64.51	3 54.05	0.759
Sun.	2	0 46 31.38	9.101	4 59 54.8	57.57	16 1.80	64.53	3 35.90	0.754
Mon.	3	0 50 9.85	9.107	5 22 53.7	57.34	16 1.52	64.55	3 17.87	0.748
Tues.	4	0 53 48.48	9.113	5 45 47.1	+57.11	16 1.25	64.58	2 59.99	0.743
Wed.	5	0 57 27.27	9.120	6 8 34.4	56.85	16 0.97	64.60	2 42.27	0.735
Thur.	6	1 1 6.25	9.129	6 31 15.5	56.58	16 0.70	64.63	2 24.75	0.726
Frid.	7	1 4 45.45	9.139	6 53 49.9	+56.31	16 0.42	64.66	2 7.45	0.716
Sat.	8	1 8 24.90	9.149	7 16 17.4	56.00	16 0.14	64.70	1 50.39	0.706
Sun.	9	1 12 4.61	9.160	7 38 37.7	55.69	15 59.86	64.73	1 33.59	0.695
Mon.	10	1 15 44.59	9.172	8 0 50.3	+55.36	15 59.58	64.77	1 17.07	0.684
Tues.	11	1 19 24.86	9.184	8 22 54.9	55.03	15 59.30	64.81	1 0.83	0.671
Wed.	12	1 23 5.44	9.197	8 44 51.4	54.67	15 59.03	64.86	0 44.91	0.658
Thur.	13	1 26 46.34	9.211	9 6 39.1	+54.30	15 58.75	64.90	0 29.30	0.644
Frid.	14	1 30 27.59	9.226	9 28 17.8	53.91	15 58.48	64.95	0 14.03	0.629
Sat.	15	1 34 9.19	9.241	9 49 47.2	53.52	15 58.21	65.00	0 0.89	0.614
Sun.	16	1 37 51.16	9.257	10 11 6.8	+53.11	15 57.95	65.06	0 15.44	0.598
Mon.	17	1 41 33.51	9.273	10 32 16.4	52.69	15 57.68	65.11	0 29.60	0.582
Tues.	18	1 45 16.25	9.290	10 53 15.6	52.24	15 57.42	65.17	0 43.36	0.566
Wed.	19	1 48 59.40	9.306	11 14 4.1	+51.78	15 57.16	65.23	0 56.74	0.550
Thur.	20	1 52 42.93	9.323	11 34 41.4	51.31	15 56.91	65.29	1 9.72	0.533
Frid.	21	1 56 26.89	9.341	11 55 7.3	50.83	15 56.65	65.35	1 22.29	0.515
Sat.	22	2 0 11.28	9.359	12 15 21.4	+50.33	15 56.40	65.42	1 34.42	0.497
Sun.	23	2 3 56.12	9.378	12 35 23.4	49.81	15 56.15	65.48	1 46.10	0.478
Mon.	24	2 7 41.41	9.397	12 55 13.0	49.29	15 55.91	65.55	1 57 33	0.459
Tues.	25	2 11 27.15	9.416	13 14 49.8	+48.76	15 55.66	65.62	2 8.11	0.440
Wed.	26	2 15 13.35	9.436	13 34 13.4	48.20	15 55.42	65.69	2 18.42	0.420
Thur.	27	2 19 0.04	9.456	13 53 23.6	47.63	15 55.18	65.76	2 28.26	0.400
Frid.	28	2 22 47.22	9.476	14 12 20.1	+47.07	15 54.94	65.84	2 37.61	0.380
Sat.	29	2 26 34.88	9.496	14 31 2.6	46.48	15 54.70	65.91	2 46.47	0.360
Sun.	30	2 30 23.07	9.518	14 49 30.8	45.87	15 54.47	65.99	2 54.82	0.338
Mon.	31	2 34 11.79	9.540	N.15 7 44.3	+45.25	15 54.23	66.07	3 2.65	0.316

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	0 42 52.44	9.098	N. 4 36 46.8	+57.79	3 54.10	0.759	0 38 58.34
Sun.	2	0 46 30.83	9.103	4 59 51.3	57.58	3 35.94	0.754	0 42 54.89
Mon.	3	0 50 9.35	9.109	5 22 50.5	57.35	3 17.91	0.748	0 46 51.44
Tues.	4	0 53 48.02	9.114	5 45 44.2	+57.12	3 0.03	0.743	0 50 47.99
Wed.	5	0 57 26.86	9.122	6 8 31.8	56.86	2 42.31	0.735	0 54 44.55
Thur.	6	1 1 5.88	9.131	6 31 13.2	56.59	2 24.78	0.726	0 58 41.10
Frid.	7	1 4 45.13	9.141	6 53 47.9	+56.32	2 7.48	0.716	1 2 37.65
Sat.	8	1 8 24.62	9.151	7 16 15.7	56.01	1 50.42	0.706	1 6 34.20
Sun.	9	1 12 4.37	9.162	7 38 36.3	55.70	1 33.61	0.695	1 10 30.76
Mon.	10	1 15 44.39	9.173	8 0 49.1	+55.37	1 17.08	0.684	1 14 27.31
Tues.	11	1 19 24.70	9.186	8 22 54.0	55.04	1 0.84	0.671	1 18 23.86
Wed.	12	1 23 5.32	9.199	8 44 50.7	54.68	0 44.91	0.658	1 22 20.41
Thur.	13	1 26 46.26	9.213	9 6 38.7	+54.31	0 29.30	0.644	1 26 16.96
Frid.	14	1 30 27.55	9.228	9 28 17.6	53.92	0 14.03	0.629	1 30 13.52
Sat.	15	1 34 9.19	9.243	9 49 47.2	53.53	0 0.89	0.614	1 34 10.08
Sun.	16	1 37 51.20	9.259	10 11 7.0	+53.12	0 15.44	0.598	1 38 6.63
Mon.	17	1 41 33.58	9.275	10 32 16.8	52.70	0 29.60	0.582	1 42 3.18
Tues.	18	1 45 16.36	9.291	10 53 16.2	52.25	0 43.37	0.566	1 45 59.73
Wed.	19	1 48 59.54	9.307	11 14 4.8	+51.79	0 56.75	0.550	1 49 56.29
Thur.	20	1 52 43.11	9.324	11 34 42.3	51.32	1 9.73	0.533	1 53 52.84
Frid.	21	1 56 27.10	9.342	11 55 8.4	50.84	1 22.30	0.515	1 57 49.40
Sat.	22	2 0 11.53	9.360	12 15 22.7	+50.34	1 34.42	0.497	2 1 45.95
Sun.	23	2 3 56.40	9.379	12 35 24.8	49.82	1 46.11	0.478	2 5 42.51
Mon.	24	2 7 41.72	9.398	12 55 14.5	49.30	1 57.34	0.459	2 9 39.06
Tues.	25	2 11 27.49	9.417	13 14 51.5	+48.77	2 8.12	0.440	2 13 35.61
Wed.	26	2 15 13.72	9.437	13 34 15.3	48.21	2 18.43	0.420	2 17 32.16
Thur.	27	2 19 0.43	9.457	13 53 25.6	47.63	2 28.28	0.400	2 21 28.72
Frid.	28	2 22 47.63	9.477	14 12 22.2	+47.07	2 37.63	0.380	2 25 25.27
Sat.	29	2 26 35.32	9.497	14 31 4.8	46.48	2 46.50	0.360	2 29 21.83
Sun.	30	2 30 23.53	9.519	14 49 33.0	45.87	2 54.84	0.338	2 33 18.38
Mon.	31	2 34 12.27	9.541	N. 15 7 46.6	+45.25	3 2.67	0.316	2 37 14.94

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S							Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.		
		λ	λ′						
		° ′ ″	′ ″	″	″				h m s
1	91	11 39 50.5	39 23.0	147.79	− 0.36	9.9999648	+ 51.5		23 17 12.14
2	92	12 38 56.4	38 28.7	147.70	0.32	0.0000887	51.7		23 13 16.23
3	93	13 38 0.1	37 32.3	147.61	0.24	0.0002131	52.0		23 9 20.32
4	94	14 37 1.8	36 33.9	147.53	− 0.15	0.0003380	+ 52.2		23 5 24.41
5	95	15 36 1.6	35 33.6	147.45	− 0.03	0.0004633	52.4		23 1 28.51
6	96	16 34 59.5	34 31.4	147.38	+ 0.09	0.0005890	52.5		22 57 32.60
7	97	17 33 55.5	33 27.3	147.30	+ 0.23	0.0007150	+ 52.5		22 53 36.69
8	98	18 32 49.7	32 21.5	147.22	0.36	0.0008411	52.5		22 49 40.78
9	99	19 31 42.2	31 13.9	147.14	0.47	0.0009672	52.4		22 45 44.89
10	100	20 30 32.9	30 4.5	147.07	+ 0.57	0.0010931	+ 52.3		22 41 48.98
11	101	21 29 21.8	28 53.3	147.00	0.64	0.0012185	52.1		22 37 53.07
12	102	22 28 9.1	27 40.5	146.93	0.70	0.0013433	51.9		22 33 57.16
13	103	23 26 54.8	26 26.1	146.86	+ 0.71	0.0014675	+ 51.6		22 30 1.26
14	104	24 25 38.7	25 9.9	146.79	0.71	0.0015909	51.2		22 26 5.35
15	105	25 24 20.8	23 51.9	146.72	0.66	0.0017133	50.8		22 22 9.44
16	106	26 23 1.1	22 32.1	146.64	+ 0.60	0.0018347	+ 50.3		22 18 13.53
17	107	27 21 39.6	21 10.5	146.56	0.50	0.0019549	49.8		22 14 17.62
18	108	28 20 16.2	19 47.0	146.48	0.39	0.0020739	49.3		22 10 21.71
19	109	29 18 50.8	18 21.5	146.40	+ 0.26	0.0021917	+ 48.8		22 6 25.80
20	110	30 17 23.5	16 54.0	146.32	+ 0.13	0.0023081	48.2		22 2 29.89
21	111	31 15 54.2	15 24.6	146.24	− 0.01	0.0024232	47.7		21 58 34.00
22	112	32 14 22.7	13 53.0	146.15	− 0.15	0.0025371	+ 47.2		21 54 38.09
23	113	33 12 49.2	12 19.4	146.06	0.26	0.0026499	46.7		21 50 42.18
24	114	34 11 13.5	10 43.6	145.97	0.36	0.0027616	46.3		21 46 46.27
25	115	35 9 35.8	9 5.8	145.88	− 0.45	0.0028723	+ 45.9		21 42 50.37
26	116	36 7 56.0	7 25.9	145.80	0.50	0.0029821	45.6		21 38 54.46
27	117	37 6 14.0	5 43.8	145.72	0.50	0.0030911	45.3		21 34 58.55
28	118	38 4 29.9	3 59.6	145.63	− 0.50	0.0031993	+ 45.0		21 31 2.64
29	119	39 2 43.9	2 13.4	145.55	0.45	0.0033070	44.7		21 27 6.73
30	120	40 0 56.0	0 25.4	145.46	0.40	0.0034141	44.5		21 23 10.82
31	121	40 59 6.4	58 35.7	145.38	− 0.30	0.0035207	+ 44.3		21 19 14.91

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January 0d.0.

Diff. for 1 Hour, — 9s.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 47.8	14 49.5	54 11.3	+ 0.46	54 17.6	+ 0.57	10 42.9	1.74	13.0
2	14 51.6	14 53.9	54 25.1	0.67	54 33.8	0.77	11 25.2	1.78	14.0
3	14 56.6	14 59.5	54 43.6	0.85	54 54.3	0.92	12 8.7	1.85	15.0
4	15 2.6	15 6.0	55 5.8	+ 0.99	55 18.2	+ 1.06	12 54.3	1.94	16.0
5	15 9.6	15 13.3	55 31.3	1.11	55 45.0	1.17	13 42.2	2.05	17.0
6	15 17.2	15 21.3	55 59.4	1.22	56 14.4	1.27	14 32.7	2.16	18.0
7	15 25.5	15 29.9	56 29.9	+ 1.31	56 46.0	+ 1.36	15 25.6	2.25	19.0
8	15 34.5	15 39.1	57 2.7	1.41	57 19.9	1.45	16 20.2	2.30	20.0
9	15 43.9	15 48.8	57 37.5	1.48	57 55.4	1.50	17 15.7	2.31	21.0
10	15 53.7	15 58.7	58 13.5	+ 1.52	58 31.7	+ 1.50	18 11.1	2.30	22.0
11	16 3.6	16 8.4	58 49.6	1.47	59 7.2	1.42	19 5.8	2.26	23.0
12	16 12.9	16 17.1	59 23.9	1.34	59 39.4	1.23	19 59.6	2.22	24.0
13	16 20.9	16 24.1	59 53.3	+ 1.07	60 5.1	+ 0.89	20 52.6	2.20	25.0
14	16 26.7	16 28.5	60 14 5	0.67	60 21.0	+ 0.41	21 45.5	2.21	26.0
15	16 29.4	16 29.3	60 24.3	+ 0.12	60 24.0	− 0.17	22 38.8	2.24	27.0
16	16 28.2	16 26.2	60 20.1	− 0.47	60 12.6	− 0.77	23 33.1	2.29	28.0
17	16 23.1	16 19.2	60 1.5	1.07	59 46.9	1.34	☌		29.0
18	16 14.4	16 8.9	59 29.3	1.58	59 9.0	1.78	0 28.4	2.33	0.6
19	16 2.8	15 56.2	58 46.6	− 1.94	58 22.6	− 2.05	1 24.6	2.35	1.6
20	15 49.4	15 42.4	57 57.5	2.12	57 31.9	2.15	2 20.8	2.33	2.6
21	15 35.4	15 28.6	57 6.2	2.12	56 41.2	2.05	3 16.0	2.26	3.6
22	15 22.0	15 15.9	56 17.1	− 1.95	55 54.5	− 1.81	4 9.2	2.15	4.6
23	15 10.2	15 5.0	55 33.5	1.66	55 14.5	1.49	4 59.8	2.04	5.6
24	15 0.4	14 56.5	54 57.7	1.30	54 43.4	1.09	5 47.5	1.93	6.6
25	14 53.3	14 50.8	54 31.5	− 0.88	54 22.2	− 0.67	6 32.7	1.83	7.6
26	14 48.9	14 47.8	54 15.4	0.45	54 11.3	− 0.24	7 15.9	1.76	8.6
27	14 47.3	14 47.5	54 9.6	− 0.04	54 10.4	+ 0.16	7 57.8	1.73	9.6
28	14 48.4	14 49.8	54 13.4	+ 0.34	54 18.6	+ 0.52	8 39.3	1.73	10.6
29	14 51.8	14 54.2	54 25.9	0.68	54 35.0	0.82	9 21.3	1.77	11.6
30	14 57.2	15 0.5	54 45.7	0.95	54 57.8	1.05	10 4.4	1.83	12.6
31	15 4.0	15 7.9	55 11.0	+ 1.14	55 25.2	+ 1.21	10 49.5	1.93	13.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 3 46.97	1.8492	N. 0 41 31.2	10.871
1	11 5 37.94	1.8498	0 30 38.8	10.876
2	11 7 28.95	1.8504	0 19 46.1	10.882
3	11 9 19.99	1.8510	N. 0 8 53.0	10.887
4	11 11 11.07	1.8517	S. 0 2 0.4	10.891
5	11 13 2.19	1.8524	0 12 53.9	10.894
6	11 14 53.36	1.8532	0 23 47.6	10.897
7	11 16 44.57	1.8540	0 34 41.5	10.898
8	11 18 35.84	1.8549	0 45 35.4	10.899
9	11 20 27.16	1.8558	0 56 29.4	10.900
10	11 22 18.54	1.8568	1 7 23.4	10.900
11	11 24 9.98	1.8578	1 18 17.4	10.900
12	11 26 1.47	1.8588	1 29 11.4	10.898
13	11 27 53.03	1.8599	1 40 5.2	10.896
14	11 29 44.66	1.8611	1 50 58.9	10.893
15	11 31 36.36	1.8622	2 1 52.4	10.890
16	11 33 28.13	1.8634	2 12 45.7	10.886
17	11 35 19.97	1.8647	2 23 38.7	10.881
18	11 37 11.89	1.8661	2 34 31.4	10.876
19	11 39 3.90	1.8675	2 45 23.8	10.870
20	11 40 55.99	1.8688	2 56 15.8	10.863
21	11 42 48.16	1.8702	3 7 7.3	10.855
22	11 44 40.42	1.8718	3 17 58.4	10.847
23	11 46 32.78	1.8734	S. 3 28 48.9	10.838

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 48 25.23	1.8750	S. 3 39 38.9	10.828
1	11 50 17.78	1.8767	3 50 28.3	10.818
2	11 52 10.43	1.8784	4 1 17.0	10.807
3	11 54 3.18	1.8801	4 12 5.1	10.795
4	11 55 56.04	1.8818	4 22 52.4	10.782
5	11 57 49.00	1.8836	4 33 38.9	10.769
6	11 59 42.07	1.8855	4 44 24.7	10.756
7	12 1 35.26	1.8875	4 55 9.6	10.741
8	12 3 28.57	1.8894	5 5 53.6	10.725
9	12 5 21.99	1.8914	5 16 36.6	10.709
10	12 7 15.54	1.8935	5 27 18.7	10.692
11	12 9 9.21	1.8955	5 37 59.7	10.674
12	12 11 3.00	1.8976	5 48 39.6	10.656
13	12 12 56.92	1.8998	5 59 18.4	10.637
14	12 14 50.98	1.9021	6 9 56.0	10.617
15	12 16 45.17	1.9043	6 20 32.5	10.597
16	12 18 39.50	1.9066	6 31 7.7	10.575
17	12 20 33.97	1.9089	6 41 41.5	10.553
18	12 22 28.57	1.9112	6 52 14.0	10.530
19	12 24 23.32	1.9137	7 2 45.1	10.506
20	12 26 18.22	1.9162	7 13 14.7	10.482
21	12 28 13.27	1.9187	7 23 42.9	10.457
22	12 30 8.47	1.9212	7 34 9.6	10.431
23	12 32 3.82	1.9238	7 44 34.6	10.404
24	12 33 59.33	1.9265	S. 7 54 58.0	10.376

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 33 59.33	1.9265	S. 7 54 58.0	10.376
1	12 35 55.00	1.9292	8 5 19.7	10.348
2	12 37 50.83	1.9318	8 15 39.7	10.319
3	12 39 46.82	1.9346	8 25 58.0	10.290
4	12 41 42.98	1.9374	8 36 14.5	10.259
5	12 43 39.31	1.9402	8 46 29.1	10.227
6	12 45 35.81	1.9431	8 56 41.7	10.194
7	12 47 32.48	1.9460	9 6 52.4	10.161
8	12 49 29.33	1.9489	9 17 1.1	10.127
9	12 51 26.35	1.9518	9 27 7.7	10.092
10	12 53 23.55	1.9548	9 37 12.2	10.057
11	12 55 20.93	1.9579	9 47 14.5	10.021
12	12 57 18.50	1.9611	9 57 14.7	9.984
13	12 59 16.26	1.9642	10 7 12.6	9.946
14	13 1 14.20	1.9673	10 17 8.2	9.907
15	13 3 12.33	1.9704	10 27 1.4	9.867
16	13 5 10.65	1.9736	10 36 52.2	9.826
17	13 7 9.17	1.9769	10 46 40.5	9.785
18	13 9 7.88	1.9802	10 56 26.4	9.743
19	13 11 6.79	1.9835	11 6 9.7	9.700
20	13 13 5.90	1.9869	11 15 50.4	9.656
21	13 15 5.22	1.9903	11 25 28.4	9.611
22	13 17 4.74	1.9937	11 35 3.7	9.566
23	13 19 4.46	1.9971	S. 11 44 36.3	9.520

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	13 21 4.39	2.0006	S. 11 54 6.1	9.472
1	13 23 4.53	2.0041	12 3 33.0	9.424
2	13 25 4.88	2.0077	12 12 57.0	9.375
3	13 27 5.45	2.0112	12 22 18.0	9.325
4	13 29 6.23	2.0148	12 31 36.0	9.274
5	13 31 7.23	2.0184	12 40 50.9	9.223
6	13 33 8.44	2.0220	12 50 2.8	9.172
7	13 35 9.87	2.0257	12 59 11.5	9.118
8	13 37 11.52	2.0294	13 8 16.9	9.063
9	13 39 13.40	2.0332	13 17 19.0	9.008
10	13 41 15.50	2.0369	13 26 17.8	8.952
11	13 43 17.83	2.0407	13 35 13.2	8.895
12	13 45 20.38	2.0444	13 44 5.2	8.837
13	13 47 23.16	2.0482	13 52 53.7	8.779
14	13 49 26.17	2.0521	14 1 38.7	8.720
15	13 51 29.41	2.0559	14 10 20.1	8.659
16	13 53 32.88	2.0598	14 18 57.8	8.596
17	13 55 36.59	2.0637	14 27 31.8	8.536
18	13 57 40.53	2.0677	14 36 2.1	8.473
19	13 59 44.71	2.0716	14 44 28.6	8.409
20	14 1 49.12	2.0755	14 52 51.2	8.344
21	14 3 53.77	2.0795	15 1 9.9	8.279
22	14 5 58.66	2.0834	15 9 24.7	8.212
23	14 8 3.78	2.0873	15 17 35.4	8.145
24	14 10 9.14	2.0913	S. 15 25 42.1	8.077

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	WEDNESDAY 5.					FRIDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 10 9.14	2.0913	S. 15 25 42.1	8.077	0	15 55 10.45	2.2802	S. 20 18 9.2	3.789
1	14 12 14.74	2.0954	15 33 44.7	8.007	1	15 57 27.36	2.2836	20 21 53.3	3.680
2	14 14 20.59	2.0995	15 41 43.0	7.937	2	15 59 44.48	2.2870	20 25 30.8	3.571
3	14 16 26.68	2.1035	15 49 37.1	7.867	3	16 2 1.80	2.2903	20 29 1.8	3.462
4	14 18 33.01	2.1075	15 57 27.0	7.795	4	16 4 19.32	2.2937	20 32 26.2	3.351
5	14 20 39.58	2.1116	16 5 12.5	7.722	5	16 6 37.04	2.2970	20 35 43.9	3.239
6	14 22 46.40	2.1157	16 12 53.6	7.648	6	16 8 54.96	2.3002	20 38 54.8	3.126
7	14 24 53.46	2.1197	16 20 30.3	7.574	7	16 11 13.07	2.3034	20 41 59.0	3.014
8	14 27 0.76	2.1237	16 28 2.5	7.498	8	16 13 31.37	2.3065	20 44 56.5	2.902
9	14 29 8.31	2.1278	16 35 30.1	7.422	9	16 15 49.85	2.3096	20 47 47.2	2.788
10	14 31 16.10	2.1319	16 42 53.1	7.345	10	16 18 8.52	2.3127	20 50 31.1	2.673
11	14 33 24.14	2.1361	16 50 11.5	7.267	11	16 20 27.37	2.3157	20 53 8.0	2.558
12	14 35 32.43	2.1402	16 57 25.2	7.188	12	16 22 46.40	2.3187	20 55 38.0	2.443
13	14 37 40.96	2.1442	17 4 34.1	7.108	13	16 25 5.61	2.3216	20 58 1.1	2.327
14	14 39 49.74	2.1483	17 11 38.2	7.027	14	16 27 24.99	2.3244	21 0 17.2	2.209
15	14 41 58.76	2.1524	17 18 37.4	6.946	15	16 29 44.54	2.3272	21 2 26.2	2.092
16	14 44 8.03	2.1565	17 25 31.7	6.864	16	16 32 4.26	2.3300	21 4 28.2	1.974
17	14 46 17.54	2.1606	17 32 21.1	6.781	17	16 34 24.14	2.3327	21 6 23.1	1.856
18	14 48 27.30	2.1647	17 39 5.4	6.696	18	16 36 44.18	2.3353	21 8 11.0	1.738
19	14 50 37.30	2.1687	17 45 44.6	6.611	19	16 39 4.38	2.3380	21 9 51.7	1.618
20	14 52 47.55	2.1728	17 52 18.7	6.525	20	16 41 24.74	2.3406	21 11 25.2	1.498
21	14 54 58.04	2.1768	17 58 47.6	6.438	21	16 43 45.25	2.3431	21 12 51.5	1.378
22	14 57 8.77	2.1809	18 5 11.3	6.351	22	16 46 5.91	2.3455	21 14 10.6	1.257
23	14 59 19.75	2.1850	S. 18 11 29.7	6.262	23	16 48 26.71	2.3479	S. 21 15 22.4	1.137
	THURSDAY 6.					SATURDAY 8.			
0	15 1 30.97	2.1890	S. 18 17 42.8	6.173	0	16 50 47.66	2.3502	S. 21 16 27.0	1.016
1	15 3 42.43	2.1930	18 23 50.5	6.083	1	16 53 8.74	2.3525	21 17 24.3	0.894
2	15 5 54.13	2.1971	18 29 52.7	5.992	2	16 55 29.96	2.3547	21 18 14.2	0.771
3	15 8 6.08	2.2012	18 35 49.5	5.900	3	16 57 51.31	2.3569	21 18 56.8	0.648
4	15 10 18.27	2.2051	18 41 40.7	5.807	4	17 0 12.79	2.3590	21 19 32.0	0.525
5	15 12 30.69	2.2090	18 47 26.3	5.714	5	17 2 34.39	2.3610	21 19 59.8	0.402
6	15 14 43.35	2.2130	18 53 6.4	5.621	6	17 4 56.11	2.3630	21 20 20.3	0.279
7	15 16 56.25	2.2169	18 58 40.8	5.525	7	17 7 17.95	2.3649	21 20 33.3	0.155
8	15 19 9.38	2.2208	19 4 9.4	5.428	8	17 9 39.90	2.3668	21 20 38.9	− 0.031
9	15 21 22.75	2.2247	19 9 32.2	5.332	9	17 12 1.96	2.3686	21 20 37.0	+ 0.094
10	15 23 36.35	2.2286	19 14 49.2	5.234	10	17 14 24.13	2.3703	21 20 27.6	0.219
11	15 25 50.18	2.2325	19 20 0.3	5.136	11	17 16 46.40	2.3720	21 20 10.7	0.344
12	15 28 4.25	2.2364	19 25 5.5	5.037	12	17 19 8.77	2.3737	21 19 46.3	0.469
13	15 30 18.55	2.2402	19 30 4.7	4.937	13	17 21 31.24	2.3752	21 19 14.4	0.595
14	15 32 33.07	2.2439	19 34 57.9	4.837	14	17 23 53.80	2.3767	21 18 34.9	0.721
15	15 34 47.82	2.2477	19 39 45.1	4.736	15	17 26 16.44	2.3781	21 17 47.9	0.847
16	15 37 2.79	2.2514	19 44 26.2	4.633	16	17 28 39.17	2.3795	21 16 53.3	0.973
17	15 39 17.98	2.2551	19 49 1.1	4.529	17	17 31 1.98	2.3808	21 15 51.1	1.099
18	15 41 33.40	2.2588	19 53 29.7	4.425	18	17 33 24.87	2.3821	21 14 41.4	1.225
19	15 43 49.04	2.2624	19 57 52.1	4.321	19	17 35 47.83	2.3833	21 13 24.1	1.352
20	15 46 4.89	2.2660	20 2 8.2	4.217	20	17 38 10.86	2.3844	21 11 59.2	1.479
21	15 48 20.96	2.2696	20 6 18.1	4.111	21	17 40 33.96	2.3855	21 10 26.7	1.606
22	15 50 37.24	2.2732	20 10 21.6	4.004	22	17 42 57.12	2.3865	21 8 46.5	1.733
23	15 52 53.74	2.2767	20 14 18.6	3.897	23	17 45 20.34	2.3875	21 6 58.7	1.860
24	15 55 10.45	2.2802	S. 20 18 9.2	3.789	24	17 47 43.62	2.3884	S. 21 5 3.3	1.987

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SUNDAY 9.					TUESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 47 43.62	2.3884	S. 21 5 3.3	1.987	0	19 42 20.20	2.3695	S. 17 6 24.8	7.818
1	17 50 6.95	2.3892	21 3 0.3	2.114	1	19 44 42.33	2.3682	16 58 32.4	7.928
2	17 52 30.32	2.3899	21 0 49.7	2.241	2	19 47 4.38	2.3668	16 50 33.4	8.037
3	17 54 53.74	2.3907	20 58 31.4	2.368	3	19 49 26.35	2.3654	16 42 27.9	8.146
4	17 57 17.20	2.3913	20 56 5.5	2.495	4	19 51 48.23	2.3640	16 34 15.9	8.253
5	17 59 40.69	2.3918	20 53 32.0	2.622	5	19 54 10.03	2.3627	16 25 57.6	8.359
6	18 2 4.22	2.3924	20 50 50.9	2.748	6	19 56 31.75	2.3613	16 17 32.9	8.465
7	18 4 27.78	2.3928	20 48 2.2	2.875	7	19 58 53.38	2.3598	16 9 1.8	8.570
8	18 6 51.36	2.3932	20 45 5.9	3.003	8	20 1 14.93	2.3584	16 0 24.5	8.674
9	18 9 14.96	2.3936	20 42 1.9	3.130	9	20 3 36.39	2.3569	15 51 41.0	8.777
10	18 11 38.59	2.3939	20 38 50.3	3.256	10	20 5 57.76	2.3555	15 42 51.3	8.879
11	18 14 2.23	2.3941	20 35 31.2	3.382	11	20 8 19.05	2.3541	15 33 55.5	8.981
12	18 16 25.88	2.3942	20 32 4.5	3.508	12	20 10 40.25	2.3526	15 24 53.6	9.082
13	18 18 49.54	2.3943	20 28 30.2	3.634	13	20 13 1.36	2.3511	15 15 45.7	9.182
14	18 21 13.20	2.3944	20 24 48.4	3.760	14	20 15 22.38	2.3496	15 6 31.8	9.281
15	18 23 36.87	2.3945	20 20 59.0	3.886	15	20 17 43.31	2.3481	14 57 12.0	9.379
16	18 26 0.54	2.3944	20 17 2.1	4.012	16	20 20 4.15	2.3466	14 47 46.4	9.476
17	18 28 24.20	2.3942	20 12 57.6	4.138	17	20 22 24.90	2.3452	14 38 14.9	9.572
18	18 30 47.85	2.3941	20 8 45.6	4.263	18	20 24 45.57	2.3437	14 28 37.7	9.667
19	18 33 11.49	2.3939	20 4 26.1	4.388	19	20 27 6.15	2.3422	14 18 54.8	9.762
20	18 35 35.12	2.3936	19 59 59.1	4.512	20	20 29 26.64	2.3407	14 9 6.3	9.855
21	18 37 58.73	2.3933	19 55 24.7	4.635	21	20 31 47.03	2.3391	13 59 12.2	9.947
22	18 40 22.32	2.3930	19 50 42.9	4.759	22	20 34 7.33	2.3377	13 49 12.6	10.039
23	18 42 45.89	2.3927	S. 19 45 53.6	4.883	23	20 36 27.55	2.3362	S. 13 39 7.5	10.129
	MONDAY 10.					WEDNESDAY 12.			
0	18 45 9.44	2.3922	S. 19 40 56.9	5.006	0	20 38 47.68	2.3347	S. 13 28 57.1	10.218
1	18 47 32.96	2.3917	19 35 52.9	5.129	1	20 41 7.72	2.3332	13 18 41.3	10.307
2	18 49 56.44	2.3911	19 30 41.5	5.252	2	20 43 27.67	2.3318	13 8 20.2	10.394
3	18 52 19.89	2.3905	19 25 22.7	5.374	3	20 45 47.54	2.3304	12 57 54.0	10.480
4	18 54 43.30	2.3898	19 19 56.6	5.496	4	20 48 7.32	2.3289	12 47 22.6	10.566
5	18 57 6.67	2.3891	19 14 23.2	5.617	5	20 50 27.01	2.3275	12 36 46.1	10.651
6	18 59 30.00	2.3884	19 8 42.6	5.738	6	20 52 46.62	2.3261	12 26 4.5	10.734
7	19 1 53.28	2.3877	19 2 54.7	5.858	7	20 55 6.14	2.3247	12 15 18.0	10.816
8	19 4 16.52	2.3869	18 56 59.6	5.978	8	20 57 25.58	2.3232	12 4 26.6	10.897
9	19 6 39.71	2.3861	18 50 57.4	6.097	9	20 59 44.93	2.3218	11 53 30.4	10.976
10	19 9 2.85	2.3852	18 44 48.0	6.216	10	21 2 4.20	2.3205	11 42 29.5	11.055
11	19 11 25.93	2.3842	18 38 31.5	6.334	11	21 4 23.39	2.3192	11 31 23.8	11.133
12	19 13 48.96	2.3833	18 32 7.9	6.452	12	21 6 42.51	2.3180	11 20 13.5	11.209
13	19 16 11.93	2.3823	18 25 37.3	6.569	13	21 9 1.55	2.3167	11 8 58.7	11.284
14	19 18 34.84	2.3812	18 18 59.6	6.686	14	21 11 20.51	2.3153	10 57 39.4	11.359
15	19 20 57.68	2.3802	18 12 14.9	6.803	15	21 13 39.39	2.3140	10 46 15.6	11.432
16	19 23 20.46	2.3792	18 5 23.3	6.918	16	21 15 58.19	2.3127	10 34 47.5	11.504
17	19 25 43.18	2.3781	17 58 24.8	7.033	17	21 18 16.92	2.3115	10 23 15.1	11.574
18	19 28 5.83	2.3769	17 51 19.4	7.148	18	21 20 35.57	2.3103	10 11 38.6	11.643
19	19 30 28.41	2.3757	17 44 7.1	7.261	19	21 22 54.15	2.3092	9 59 57.9	11.712
20	19 32 50.92	2.3745	17 36 48.1	7.373	20	21 25 12.67	2.3081	9 48 13.1	11.779
21	19 35 13.35	2.3732	17 29 22.3	7.486	21	21 27 31.12	2.3069	9 36 24.4	11.844
22	19 37 35.71	2.3720	17 21 49.8	7.598	22	21 29 49.50	2.3058	9 24 31.8	11.909
23	19 39 57.99	2.3707	17 14 10.6	7.708	23	21 32 7.82	2.3047	9 12 35.3	11.974
24	19 42 20.20	2.3695	S. 17 6 24.8	7.818	24	21 34 26.07	2.3037	S. 9 0 34.9	12.037

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 34 26.07	2.3037	S. 9 0 34.9	12.037
1	21 36 44.26	2.3027	8 48 30.9	12.097
2	21 39 2.39	2.3017	8 36 23.3	12.156
3	21 41 20.46	2.3007	8 24 12.2	12.214
4	21 43 38.48	2.2998	8 11 57.6	12.272
5	21 45 56.44	2.2989	7 59 39.6	12.328
6	21 48 14.35	2.2981	7 47 18.3	12.382
7	21 50 32.21	2.2972	7 34 53.8	12.435
8	21 52 50.02	2.2964	7 22 26.1	12.487
9	21 55 7.78	2.2957	7 9 55.3	12.538
10	21 57 25.50	2.2950	6 57 21.5	12.587
11	21 59 43.18	2.2942	6 44 44.8	12.635
12	22 2 0.81	2.2935	6 32 5.3	12.682
13	22 4 18.40	2.2929	6 19 23.0	12.727
14	22 6 35.96	2.2924	6 6 38.0	12.771
15	22 8 53.49	2.2918	5 53 50.5	12.813
16	22 11 10.98	2.2912	5 41 0.5	12.854
17	22 13 28.44	2.2907	5 28 8.0	12.894
18	22 15 45.87	2.2903	5 15 13.2	12.933
19	22 18 3.28	2.2900	5 2 16.1	12.969
20	22 20 20.67	2.2896	4 49 16.9	13.004
21	22 22 38.03	2.2893	4 36 15.6	13.038
22	22 24 55.38	2.2890	4 23 12.3	13.072
23	22 27 12.71	2.2887	S. 4 10 7.0	13.103

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 29 30.02	2.2884	S. 3 56 59.9	13.132
1	22 31 47.32	2.2883	3 43 51.1	13.161
2	22 34 4.62	2.2882	3 30 40.6	13.188
3	22 36 21.91	2.2881	3 17 28.5	13.214
4	22 38 39.19	2.2880	3 4 14.9	13.238
5	22 40 56.47	2.2880	2 50 59.9	13.261
6	22 43 13.75	2.2880	2 37 43.6	13.282
7	22 45 31.03	2.2881	2 24 26.1	13.302.
8	22 47 48.32	2.2882	2 11 7.4	13.320
9	22 50 5.62	2.2883	1 57 47.7	13.337
10	22 52 22.92	2.2885	1 44 27.0	13.352
11	22 54 40.24	2.2887	1 31 5.4	13.366
12	22 56 57.57	2.2890	1 17 43.1	13.378
13	22 59 14.92	2.2893	1 4 20.1	13.388
14	23 1 32.29	2.2897	0 50 56.5	13.398
15	23 3 49.68	2.2900	0 37 32.3	13.407
16	23 6 7.09	2.2904	0 24 7.7	13.413
17	23 8 24.53	2.2909	S. 0 10 42.8	13.417
18	23 10 42.00	2.2914	N. 0 2 42.3	13.420
19	23 12 59.50	2.2920	0 16 7.6	13.422
20	23 15 17.04	2.2926	0 29 33.0	13.422
21	23 17 34.61	2.2932	0 42 58.3	13.421
22	23 19 52.22	2.2938	0 56 23.5	13.418
23	23 22 9.87	2.2945	1 9 48.5	13.413
24	23 24 27.56	2.2953	N. 1 23 13.1	13.407

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 24 27.56	2.2953	N. 1 23 13.1	13.407
1	23 26 45.30	2.2961	1 36 37.3	13.400
2	23 29 3.09	2.2968	1 50 1.1	13.392
3	23 31 20.92	2.2977	2 3 24.3	13.381
4	23 33 38.81	2.2986	2 16 46.8	13.368
5	23 35 56.75	2.2995	2 30 8.5	13.355
6	23 38 14.75	2.3005	2 43 29.4	13.340
7	23 40 32.81	2.3015	2 56 49.3	13.323
8	23 42 50.93	2.3025	3 10 8.2	13.305
9	23 45 9.11	2.3036	3 23 25.9	13.285
10	23 47 27.36	2.3047	3 36 42.4	13.263
11	23 49 45.67	2.3058	3 49 57.5	13.240
12	23 52 4.05	2.3069	4 3 11.2	13.216
13	23 54 22.50	2.3082	4 16 23.4	13.190
14	23 56 41.03	2.3094	4 29 34.0	13.162
15	23 58 59.63	2.3107	4 42 42.9	13.133
16	0 1 18.31	2.3119	4 55 50.0	13.102
17	0 3 37.06	2.3132	5 8 55.2	13.071
18	0 5 55.89	2.3146	5 21 58.5	13.037
19	0 8 14.81	2.3160	5 34 59.7	13.002
20	0 10 33.81	2.3173	5 47 58.7	12.964
21	0 12 52.89	2.3187	6 0 55.4	12.926
22	0 15 12.06	2.3202	6 13 49.8	12.887
23	0 17 31.32	2.3217	N. 6 26 41.8	12.846

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 19 50.67	2.3232	N. 6 39 31.3	12.803
1	0 22 10.11	2.3247	6 52 18.2	12.758
2	0 24 29.64	2.3263	7 5 2.3	12.712
3	0 26 49.27	2.3279	7 17 43.6	12.664
4	0 29 8.99	2.3295	7 30 22.0	12.615
5	0 31 28.81	2.3311	7 42 57.4	12.565
6	0 33 48.72	2.3327	7 55 29.8	12.513
7	0 36 8.73	2.3344	8 7 59.0	12.459
8	0 38 28.84	2.3361	8 20 24.9	12.404
9	0 40 49.06	2.3378	8 32 47.5	12.348
10	0 43 9.38	2.3395	8 45 6.7	12.291
11	0 45 29.80	2.3412	8 57 22.4	12.231
12	0 47 50.32	2.3429	9 9 34.4	12.169
13	0 50 10.95	2.3447	9 21 42.7	12.107
14	0 52 31.68	2.3464	9 33 47.3	12.044
15	0 54 52.52	2.3482	9 45 48.0	11.979
16	0 57 13.46	2.3499	9 57 44.8	11.912
17	0 59 34.51	2.3517	10 9 37.5	11.844
18	1 1 55.67	2.3536	10 21 26.1	11.775
19	1 4 16.94	2.3553	10 33 10.5	11.704
20	1 6 38.31	2.3571	10 44 50.6	11.632
21	1 8 59.79	2.3589	10 56 26.3	11.558
22	1 11 21.38	2.3607	11 7 57.5	11.483
23	1 13 43.08	2.3625	11 19 24.2	11.407
24	1 16 4.88	2.3643	N. 11 30 46.3	11.329

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 17.					WEDNESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 16 4.88	2.3643	N.11 30 46.3	11.329	0	3 11 19.16	2.4244	N.18 42 42.8	6.297
1	1 18 26.79	2.3661	11 42 3.7	11.250	1	3 13 44.63	2.4246	18 48 56.9	6.172
2	1 20 48.81	2.3679	11 53 16.3	11.169	2	3 16 10.11	2.4247	18 55 3.5	6.047
3	1 23 10.94	2.3697	12 4 24.0	11.087	3	3 18 35.60	2.4248	19 1 2.5	5.921
4	1 25 33.18	2.3715	12 15 26.8	11.005	4	3 21 1.09	2.4247	19 6 54.0	5.795
5	1 27 55.52	2.3733	12 26 24.6	10.921	5	3 23 26.57	2.4247	19 12 37.9	5.669
6	1 30 17.97	2.3751	12 37 17.3	10.835	6	3 25 52.05	2.4246	19 18 14.3	5.543
7	1 32 40.53	2.3768	12 48 4.8	10.748	7	3 28 17.52	2.4243	19 23 43.1	5.416
8	1 35 3.19	2.3786	12 58 47.1	10.660	8	3 30 42.97	2.4241	19 29 4.2	5.288
9	1 37 25.96	2.3803	13 9 24.0	10.570	9	3 33 8.41	2.4238	19 34 17.6	5.159
10	1 39 48.83	2.3820	13 19 55.5	10.480	10	3 35 33.83	2.4234	19 39 23.3	5.032
11	1 42 11.80	2.3838	13 30 21.6	10.389	11	3 37 59.22	2.4229	19 44 21.4	4.904
12	1 44 34.88	2.3855	13 40 42.2	10.296	12	3 40 24.58	2.4223	19 49 11.8	4.776
13	1 46 58.06	2.3871	13 50 57.1	10.201	13	3 42 49.90	2.4218	19 53 54.5	4.647
14	1 49 21.34	2.3887	14 1 6.3	10.106	14	3 45 15.19	2.4212	19 58 29.4	4.517
15	1 51 44.71	2.3903	14 11 9.8	10.010	15	3 47 40.44	2.4204	20 2 56.6	4.388
16	1 54 8.18	2.3920	14 21 7.5	9.912	16	3 50 5.64	2.4196	20 7 16.0	4.259
17	1 56 31.75	2.3937	14 30 59.3	9.813	17	3 52 30.79	2.4187	20 11 27.7	4.130
18	1 58 55.42	2.3953	14 40 45.1	9.713	18	3 54 55.88	2.4177	20 15 31.6	4.000
19	2 1 19.18	2.3968	14 50 24.9	9.612	19	3 57 20.91	2.4167	20 19 27.7	3.871
20	2 3 43.03	2.3983	14 59 58.6	9.511	20	3 59 45.88	2.4156	20 23 16.1	3.742
21	2 6 6.97	2.3998	15 9 26.2	9.408	21	4 2 10.78	2.4144	20 26 56.7	3.612
22	2 8 31.00	2.4012	15 18 47.6	9.303	22	4 4 35.61	2.4132	20 30 29.5	3.482
23	2 10 55.11	2.4026	N.15 28 2.6	9.198	23	4 7 0.36	2.4119	N.20 33 54.5	3.352
	TUESDAY 18.					THURSDAY 20.			
0	2 13 19.31	2.4040	N.15 37 11.3	9.092	0	4 9 25.04	2.4106	N.20 37 11.7	3.222
1	2 15 43.59	2.4054	15 46 13.6	8.985	1	4 11 49.63	2.4091	20 40 21.1	3.092
2	2 18 7.95	2.4068	15 55 9.5	8.877	2	4 14 14.13	2.4075	20 43 22.8	2.963
3	2 20 32.40	2.4081	16 3 58.8	8.768	3	4 16 38.53	2.4059	20 46 16.7	2.833
4	2 22 56.92	2.4093	16 12 41.6	8.658	4	4 19 2.84	2.4043	20 49 2.8	2.703
5	2 25 21.51	2.4104	16 21 17.8	8.547	5	4 21 27.05	2.4026	20 51 41.1	2.574
6	2 27 46.17	2.4116	16 29 47.3	8.435	6	4 23 51.15	2.4008	20 54 11.7	2.446
7	2 30 10.90	2.4127	16 38 10.0	8.323	7	4 26 15.14	2.3989	20 56 34.6	2.317
8	2 32 35.70	2.4138	16 46 26.0	8.210	8	4 28 39.02	2.3970	20 58 49.7	2.187
9	2 35 0.56	2.4148	16 54 35.2	8.096	9	4 31 2.78	2.3949	21 0 57.0	2.058
10	2 37 25.48	2.4158	17 2 37.5	7.981	10	4 33 26.41	2.3928	21 2 56.6	1.930
11	2 39 50.46	2.4168	17 10 32.9	7.865	11	4 35 49.92	2.3907	21 4 48.6	1.802
12	2 42 15.50	2.4178	17 18 21.3	7.748	12	4 38 13.30	2.3885	21 6 32.9	1.674
13	2 44 40.59	2.4186	17 26 2.7	7.631	13	4 40 36.54	2.3862	21 8 9.5	1.547
14	2 47 5.73	2.4193	17 33 37.0	7.513	14	4 42 59.64	2.3839	21 9 38.5	1.419
15	2 49 30.91	2.4201	17 41 4.2	7.394	15	4 45 22.61	2.3816	21 10 59.8	1.292
16	2 51 56.14	2.4208	17 48 24.3	7.274	16	4 47 45.43	2.3790	21 12 13.5	1.165
17	2 54 21.41	2.4215	17 55 37.1	7.153	17	4 50 8.09	2.3764	21 13 19.6	1.038
18	2 56 46.72	2.4221	18 2 42.7	7.033	18	4 52 30.60	2.3738	21 14 18.1	0.912
19	2 59 12.06	2.4226	18 9 41.1	6.912	19	4 54 52.95	2.3712	21 15 9.1	0.787
20	3 1 37.43	2.4231	18 16 32.2	6.790	20	4 57 15.14	2.3684	21 15 52.6	0.662
21	3 4 2.83	2.4236	18 23 15.9	6.668	21	4 59 37.16	2.3656	21 16 28.5	0.537
22	3 6 28.26	2.4239	18 29 52.3	6.545	22	5 1 59.01	2.3627	21 16 57.0	0.412
23	3 8 53.70	2.4242	18 36 21.3	6.421	23	5 4 20.69	2.3598	21 17 18.0	0.287
24	3 11 19.16	2.4244	N.18 42 42.8	6.297	24	5 6 42.19	2.3568	N.21 17 31.5	0.163

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 21.					**SUNDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 6 42.19	2.3568	N.21 17 31.5	0.163	0	6 55 31.32	2.1654	N.19 14 21.5	5.027
1	5 9 3.51	2.3538	21 17 37.6	+ 0.041	1	6 57 41.11	2.1609	19 9 17.2	5.116
2	5 11 24.64	2.3507	21 17 36.4	− 0.082	2	6 59 50.62	2.1563	19 4 7.6	5.204
3	5 13 45 59	2.3476	21 17 27.8	0.204	3	7 1 59.86	2.1518	18 58 52.7	5.293
4	5 16 6.35	2.3443	21 17 11.9	0.326	4	7 4 8.83	2.1473	18 53 32.5	5.381
5	5 18 26.91	2.3411	21 16 48.7	0.447	5	7 6 17.54	2.1429	18 48 7.0	5.468
6	5 20 47.28	2.3378	21 16 18.3	0.567	6	7 8 25.98	2.1384	18 42 36.3	5.554
7	5 23 7.45	2.3344	21 15 40.6	0.687	7	7 10 34.15	2.1339	18 37 0.5	5.638
8	5 25 27.41	2.3309	21 14 55.8	0.807	8	7 12 42.05	2.1295	18 31 19.7	5.722
9	5 27 47.16	2.3274	21 14 3.8	0.926	9	7 14 49.69	2.1251	18 25 33.8	5.806
10	5 30 6.70	2.3239	21 13 4.7	1.044	10	7 16 57.06	2.1206	18 19 43.0	5.889
11	5 32 26.03	2.3204	21 11 58.5	1.162	11	7 19 4.16	2.1161	18 13 47.2	5.971
12	5 34 45.15	2.3168	21 10 45.3	1.279	12	7 21 10.99	2.1117	18 7 46.5	6.052
13	5 37 4.05	2.3131	21 9 25.0	1.396	13	7 23 17.56	2.1073	18 1 41.0	6.132
14	5 39 22.72	2.3093	21 7 57.8	1.512	14	7 25 23.87	2.1029	17 55 30.7	6.212
15	5 41 41.17	2.3056	21 6 23.6	1.627	15	7 27 29.91	2.0985	17 49 15.6	6.290
16	5 43 59.39	2.3018	21 4 42.5	1.742	16	7 29 35.69	2.0942	17 42 55.9	6.368
17	5 46 17.38	2.2980	21 2 54.6	1.855	17	7 31 41.21	2.0898	17 36 31.5	6.445
18	5 48 35.15	2.2942	21 0 59.9	1.968	18	7 33 46.46	2.0854	17 30 2.5	6.522
19	5 50 52.68	2.2902	20 58 58.4	2.081	19	7 35 51.46	2.0811	17 23 28.9	6.597
20	5 53 9.97	2.2863	20 56 50.2	2.193	20	7 37 56.20	2.0768	17 16 50.8	6.672
21	5 55 27.03	2.2823	20 54 35.2	2.305	21	7 40 0.68	2.0725	17 10 8.3	6.746
22	5 57 43.85	2.2782	20 52 13.6	2.415	22	7 42 4.90	2.0683	17 3 21.3	6.819
23	6 0 0.42	2.2741	N.20 49 45.4	2.525	23	7 44 8.87	2.0641	N.16 56 30.0	6.891
	SATURDAY 22					**MONDAY 24.**			
0	6 2 16.74	2.2700	N.20 47 10.6	2.634	0	7 46 12.59	2.0599	N.16 49 34.4	6.962
1	6 4 32.82	2.2659	20 44 29.3	2.742	1	7 48 16.06	2.0557	16 42 34.5	7.033
2	6 6 48.65	2.2617	20 41 41.5	2.850	2	7 50 19.28	2.0515	16 35 30.4	7.104
3	6 9 4.23	2.2576	20 38 47.3	2.957	3	7 52 22.24	2.0473	16 28 22.0	7.174
4	6 11 19.56	2.2534	20 35 46.7	3.063	4	7 54 24.96	2.0432	16 21 9.5	7.242
5	6 13 34.64	2.2492	20 32 39.7	3.169	5	7 56 27.43	2.0392	16 13 52.9	7.310
6	6 15 49.46	2.2449	20 29 26.4	3.274	6	7 58 29.66	2.0351	16 6 32.3	7.377
7	6 18 4.02	2.2406	20 26 6.8	3.378	7	8 0 31.64	2.0311	15 59 7.6	7.444
8	6 20 18.33	2.2363	20 22 41.0	3.481	8	8 2 33.39	2.0272	15 51 39.0	7.509
9	6 22 32.38	2.2320	20 19 9.1	3.583	9	8 4 34.90	2.0232	15 44 6.5	7.574
10	6 24 46.17	2.2276	20 15 31.1	3.684	10	8 6 36.17	2.0193	15 36 30.1	7.638
11	6 26 59.69	2.2232	20 11 47.0	3.786	11	8 8 37.21	2.0154	15 28 49.9	7.702
12	6 29 12.95	2.2188	20 7 56.8	3.886	12	8 10 38.02	2.0115	15 21 5.9	7.765
13	6 31 25.95	2.2144	20 4 0.7	3.985	13	8 12 38.59	2.0076	15 13 18.1	7.827
14	6 33 38.68	2.2100	19 59 58.6	4.084	14	8 14 38.93	2.0038	15 5 26.7	7.888
15	6 35 51.15	2.2056	19 55 50.6	4.182	15	8 16 39.05	2.0001	14 57 31.6	7.948
16	6 38 3.35	2.2012	19 51 36.8	4.279	16	8 18 38.94	1.9963	14 49 32.9	8.008
17	6 40 15.29	2.1967	19 47 17.2	4.375	17	8 20 38.61	1.9927	14 41 30.6	8.068
18	6 42 26.96	2.1922	19 42 51.8	4.471	18	8 22 38.06	1.9890	14 33 24.7	8.127
19	6 44 38.36	2.1877	19 38 20.7	4.565	19	8 24 37.29	1.9853	14 25 15.4	8.184
20	6 46 49.49	2.1832	19 33 44.0	4.658	20	8 26 36.30	1.9817	14 17 2.7	8.241
21	6 49 0.35	2.1787	19 29 1.7	4.751	21	8 28 35.10	1.9782	14 8 46.5	8.297
22	6 51 10.94	2.1742	19 24 13.8	4.844	22	8 30 33.69	1.9747	14 0 27.0	8.352
23	6 53 21.26	2.1698	19 19 20.4	4.936	23	8 32 32.07	1.9712	13 52 4.2	8.407
24	6 55 31.32	2.1654	N.19 14 21.5	5.027	24	8 34 30.24	1.9678	N.13 43 38.1	8.462

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 25.					THURSDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 34 30.24	1.9678	N.13 43 38.1	8.462	0	10 5 51.08	1.8568	N. 6 7 16.0	10.317
1	8 36 28.21	1.9644	13 35 8.8	8.515	1	10 7 42.46	1.8558	5 56 56.2	10.342
2	8 38 25.97	1.9610	13 26 36.3	8.568	2	10 9 33.78	1.8548	5 46 35.0	10.365
3	8 40 23.53	1.9577	13 18 0.6	8.621	3	10 11 25.03	1.8538	5 36 12.4	10.387
4	8 42 20.90	1.9545	13 9 21.8	8.672	4	10 13 16.23	1.8529	5 25 48.5	10.409
5	8 44 18.07	1.9513	13 0 39.9	8.723	5	10 15 7.38	1.8520	5 15 23.3	10.431
6	8 46 15.05	1.9482	12 51 55.0	8.773	6	10 16 58.47	1.8511	5 4 56.7	10.453
7	8 48 11.85	1.9450	12 43 7.1	8.823	7	10 18 49.51	1.8503	4 54 28.9	10.473
8	8 50 8.45	1.9418	12 34 16.3	8.872	8	10 20 40.51	1.8496	4 43 59.9	10.493
9	8 52 4.86	1.9387	12 25 22.5	8.920	9	10 22 31.47	1.8490	4 33 29.7	10.512
10	8 54 1.09	1.9357	12 16 25.9	8.967	10	10 24 22.39	1.8484	4 22 58.4	10.531
11	8 55 57.15	1.9328	12 7 26.5	9.014	11	10 26 13.28	1.8478	4 12 26.0	10.550
12	8 57 53.03	1.9298	11 58 24.2	9.061	12	10 28 4.13	1.8472	4 1 52.4	10.568
13	8 59 48.73	1.9270	11 49 19.2	9.106	13	10 29 54.95	1.8468	3 51 17.8	10.585
14	9 1 44.27	1.9242	11 40 11.5	9.151	14	10 31 45.75	1.8465	3 40 42.2	10.601
15	9 3 39.64	1.9214	11 31 1.1	9.196	15	10 33 36.53	1.8462	3 30 5.7	10.617
16	9 5 34.84	1.9187	11 21 48.0	9.239	16	10 35 27.29	1.8459	3 19 28.2	10.632
17	9 7 29.88	1.9159	11 12 32.4	9.282	17	10 37 18.03	1.8456	3 8 49.8	10.647
18	9 9 24.75	1.9132	11 3 14.2	9.325	18	10 39 8.76	1.8454	2 58 10.5	10.662
19	9 11 19.47	1.9106	10 53 53.4	9.367	19	10 40 59.48	1.8453	2 47 30.4	10.675
20	9 13 14.03	1.9081	10 44 30.2	9.408	20	10 42 50.20	1.8452	2 36 49.5	10.688
21	9 15 8.44	1.9056	10 35 4.5	9.448	21	10 44 40.91	1.8451	2 26 7.8	10.701
22	9 17 2.70	1.9032	10 25 36.4	9.488	22	10 46 31.62	1.8452	2 15 25.3	10.713
23	9 18 56.82	1.9008	N.10 16 5.9	9.527	23	10 48 22.34	1.8453	N. 2 4 42.2	10.724
	WEDNESDAY 26.					FRIDAY 28.			
0	9 20 50.80	1.8985	N.10 6 33.1	9.566	0	10 50 13.06	1.8454	N. 1 53 58.4	10.735
1	9 22 44.64	1.8962	9 56 58.0	9.604	1	10 52 3.79	1.8456	1 43 14.0	10.745
2	9 24 38.34	1.8939	9 47 20.6	9.642	2	10 53 54.54	1.8459	1 32 29.0	10.755
3	9 26 31.90	1.8916	9 37 40.9	9.679	3	10 55 45.30	1.8462	1 21 43.4	10.764
4	9 28 25.33	1.8894	9 27 59.1	9.715	4	10 57 36.08	1.8466	1 10 57.3	10.772
5	9 30 18.63	1.8873	9 18 15.1	9.751	5	10 59 26.89	1.8470	1 0 10.7	10.780
6	9 32 11.81	1.8852	9 8 29.0	9.786	6	11 1 17.72	1.8474	0 49 23.7	10.787
7	9 34 4.86	1.8832	8 58 40.8	9.820	7	11 3 8.58	1.8479	0 38 36.3	10.793
8	9 35 57.80	1.8813	8 48 50.6	9.854	8	11 4 59.47	1.8485	0 27 48.5	10.800
9	9 37 50.62	1.8794	8 38 58.3	9.888	9	11 6 50.40	1.8491	0 17 0.3	10.806
10	9 39 43.33	1.8776	8 29 4.0	9.921	10	11 8 41.36	1.8498	N. 0 6 11.8	10.810
11	9 41 35.93	1.8758	8 19 7.8	9.953	11	11 10 32.37	1.8505	S. 0 4 36.9	10.814
12	9 43 28.42	1.8740	8 9 9.7	9.984	12	11 12 23.42	1.8513	0 15 25.9	10.818
13	9 45 20.81	1.8723	7 59 9.7	10.015	13	11 14 14.52	1.8521	0 26 15.1	10.821
14	9 47 13.10	1.8706	7 49 7.9	10.045	14	11 16 5.67	1.8530	0 37 4.4	10.823
15	9 49 5.28	1.8689	7 39 4.3	10.075	15	11 17 56.88	1.8539	0 47 53.9	10.825
16	9 50 57.37	1.8674	7 28 58.9	10.105	16	11 19 48.14	1.8549	0 58 43.4	10.826
17	9 52 49.37	1.8660	7 18 51.7	10.134	17	11 21 39.47	1.8560	1 9 33.0	10.827
18	9 54 41.29	1.8646	7 8 42.8	10.162	18	11 23 30.86	1.8570	1 20 22.6	10.827
19	9 56 33.12	1.8632	6 58 32.3	10.189	19	11 25 22.31	1.8582	1 31 12.2	10.826
20	9 58 24.87	1.8618	6 48 20.2	10.216	20	11 27 13.84	1.8594	1 42 1.7	10.824
21	10 0 16.54	1.8605	6 38 6.4	10.242	21	11 29 5.44	1.8607	1 52 51.1	10.822
22	10 2 8.13	1.8592	6 27 51.1	10.267	22	11 30 57.12	1.8620	2 3 40.3	10.819
23	10 3 59.64	1.8579	6 17 34.3	10.292	23	11 32 48.88	1.8633	2 14 29.3	10.816
24	10 5 51.08	1.8568	N. 6 7 16.0	10.317	24	11 34 40.72	1.8647	S. 2 25 18.2	10.812

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SATURDAY 29.					SUNDAY 30.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 34 40.72	1.8647	S. 2 25 18.2	10.812	0	12 19 57.77	1.9138	S. 6 42 0.7	10.514
1	11 36 32.65	1.8662	2 36 6.8	10.807	1	12 21 52.67	1.9164	6 52 30.9	10.492
2	11 38 24.67	1.8677	2 46 55.1	10.802	2	12 23 47.74	1.9191	7 2 59.7	10.469
3	11 40 16.77	1.8692	2 57 43.0	10.796	3	12 25 42.97	1.9218	7 13 27.2	10.446
4	11 42 8.97	1.8708	3 8 30.6	10.790	4	12 27 38.36	1.9246	7 23 53.3	10.423
5	11 44 1.27	1.8726	3 19 17.8	10.782	5	12 29 33.92	1.9275	7 34 18.0	10.399
6	11 45 53.68	1.8743	3 30 4.5	10.774	6	12 31 29.66	1.9304	7 44 41.2	10.373
7	11 47 46.19	1.8761	3 40 50.7	10.766	7	12 33 25.57	1.9333	7 55 2.8	10.347
8	11 49 38.81	1.8778	3 51 36.4	10.757	8	12 35 21.66	1.9362	8 5 22.9	10.321
9	11 51 31.53	1.8797	4 2 21.5	10.747	9	12 37 17.92	1.9392	8 15 41.4	10.294
10	11 53 24.37	1.8817	4 13 6.0	10.736	10	12 39 14.37	1.9423	8 25 58.2	10.265
11	11 55 17.33	1.8837	4 23 49.8	10.725	11	12 41 11.00	1.9454	8 36 13.2	10.235
12	11 57 10.41	1.8857	4 34 33.0	10.713	12	12 43 7.82	1.9486	8 46 26.4	10.204
13	11 59 3.61	1.8877	4 45 15.4	10.700	13	12 45 4.83	1.9518	8 56 37.8	10.174
14	12 0 56.94	1.8898	4 55 57.0	10.687	14	12 47 2.03	1.9550	9 6 47.3	10.143
15	12 2 50.39	1.8920	5 6 37.8	10.673	15	12 48 59.43	1.9583	9 16 55.0	10.111
16	12 4 43.98	1.8942	5 17 17.7	10.658	16	12 50 57.02	1.9616	9 27 0.7	10.077
17	12 6 37.70	1.8965	5 27 56.7	10.643	17	12 52 54.82	1.9650	9 37 4.3	10.043
18	12 8 31.56	1.8988	5 38 34.8	10.627	18	12 54 52.82	1.9684	9 47 5.9	10.009
19	12 10 25.56	1.9012	5 49 11.9	10.609	19	12 56 51.03	1.9718	9 57 5.4	9.973
20	12 12 19.70	1.9036	5 59 47.9	10.591	20	12 58 49.44	1.9752	10 7 2.7	9.937
21	12 14 13.99	1.9061	6 10 22.8	10.572	21	13 0 48.06	1.9787	10 16 57.8	9.899
22	12 16 8.43	1.9086	6 20 56.6	10.553	22	13 2 46.89	1.9823	10 26 50.6	9.861
23	12 18 3.02	1.9112	6 31 29.2	10.534	23	13 4 45.94	1.9859	10 36 41.1	9.822
24	12 19 57.77	1.9138	S. 6 42 0.7	10.514	24	13 6 45.20	1.9895	S. 10 46 29.2	9.782

PHASES OF THE MOON.

	d	h	m
○ Full Moon	8	5	47.0
☾ Last Quarter	10	18	30.4
● New Moon	17	9	38.5
☽ First Quarter	24	18	55.7

	d	h
☾ Perigee	15	5.0
☾ Apogee	27	2.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
1	Mars	W.	65° 5′ 13″	3225	66° 30′ 52″	3220	67° 56′ 37″	3214	69° 22′ 29″	3209
	Pollux	W.	56 18 10	3146	57 45 24	3138	59 12 48	3129	60 40 22	3121
	Regulus	W.	19 20 7	3219	20 45 54	3191	22 12 14	3168	23 39 2	3147
	Spica	E.	35 27 22	3041	33 58 0	3037	32 28 33	3032	30 59 0	3026
	Antares	E.	80 59 41	3056	79 30 38	3052	78 1 30	3047	76 32 16	3043
2	Mars	W.	76 33 31	3179	78 0 5	3173	79 26 47	3166	80 53 37	3160
	Pollux	W.	68 0 38	3082	69 29 10	3074	70 57 51	3067	72 26 41	3059
	Regulus	W.	30 58 28	3070	32 27 14	3058	33 56 15	3047	35 25 30	3036
	Antares	E.	69 4 31	3016	67 34 38	3010	66 4 38	3005	64 34 31	2999
3	Mars	W.	88 9 46	3125	89 37 25	3119	91 5 12	3111	92 33 8	3104
	Pollux	W.	79 53 17	3020	81 23 5	3013	82 53 2	3005	84 23 8	2997
	Regulus	W.	42 54 57	2986	44 25 27	2977	45 56 8	2968	47 27 1	2959
	Antares	E.	57 2 5	2969	55 31 14	2963	54 0 15	2957	52 29 8	2951
	α Aquilæ	E.	108 37 22	3415	107 15 23	3400	105 53 7	3386	104 30 34	3372
4	Mars	W.	99 55 2	3067	101 23 52	3060	102 52 51	3052	104 21 59	3045
	Pollux	W.	91 56 0	2961	93 27 2	2953	94 58 14	2946	96 29 35	2939
	Regulus	W.	55 4 14	2915	56 36 14	2906	58 8 25	2898	59 40 47	2889
	Antares	E.	44 51 42	2922	43 19 51	2916	41 47 53	2912	40 15 49	2907
	α Aquilæ	E.	97 34 11	3313	96 10 15	3303	94 46 7	3294	93 21 48	3284
5	Pollux	W.	104 8 36	2903	105 40 51	2897	107 13 14	2890	108 45 46	2883
	Regulus	W.	67 25 23	2846	68 58 51	2838	70 32 30	2829	72 6 20	2820
	Antares	E.	32 34 3	2887	31 1 28	2886	29 28 51	2886	27 56 14	2887
	α Aquilæ	E.	86 17 43	3247	84 52 29	3240	83 27 7	3235	82 1 39	3230
	Fomalhaut	E.	113 49 48	3393	112 27 24	3373	111 4 37	3353	109 41 27	3334
6	Regulus	W.	79 58 21	2777	81 33 19	2769	83 8 28	2760	84 43 49	2750
	Spica	W.	25 57 39	2760	27 33 0	2751	29 8 32	2742	30 44 16	2732
	α Aquilæ	E.	74 53 5	3214	73 27 13	3213	72 1 19	3213	70 35 25	3214
	Fomalhaut	E.	102 40 29	3253	101 15 22	3239	99 50 0	3225	98 24 21	3214
	Sun	E.	148 23 56	3136	146 56 30	3124	145 28 50	3113	144 0 56	3101
7	Regulus	W.	92 43 31	2706	94 20 3	2697	95 56 47	2688	97 33 43	2678
	Spica	W.	38 45 59	2687	40 22 56	2678	42 0 6	2668	43 37 29	2659
	α Aquilæ	E.	63 26 32	3232	62 1 1	3240	60 35 39	3249	59 10 28	3260
	Fomalhaut	E.	91 12 36	3159	89 45 38	3149	88 18 28	3141	86 51 8	3133
	α Pegasi	E.	109 39 34	2845	108 6 4	2832	106 32 18	2821	104 58 17	2808
	Sun	E.	136 38 0	3046	135 8 44	3035	133 39 15	3024	132 9 32	3013
8	Spica	W.	51 47 35	2610	53 26 16	2601	55 5 10	2591	56 44 18	2580
	α Aquilæ	E.	52 8 28	3346	50 45 10	3372	49 22 21	3401	48 0 6	3435
	Fomalhaut	E.	79 32 24	3105	78 4 20	3101	76 36 11	3097	75 7 58	3096
	α Pegasi	E.	97 4 27	2753	95 28 58	2742	93 53 14	2732	92 17 16	2722
	Sun	E.	124 37 31	2958	123 6 26	2947	121 35 7	2935	120 3 33	2924
9	Spica	W.	65 3 28	2529	66 44 1	2518	68 24 49	2507	70 5 52	2497
	Antares	W.	20 12 19	2673	21 49 35	2643	23 27 32	2616	25 6 5	2593
	α Aquilæ	E.	41 20 8	3688	40 3 8	3763	38 47 27	3848	37 33 14	3945
	Fomalhaut	E.	67 46 38	3099	66 18 27	3104	64 50 22	3110	63 22 25	3118
	α Pegasi	E.	84 14 5	2672	82 36 47	2663	80 59 17	2653	79 21 34	2644

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Mars	W.	70° 48′ 27″	3204	72° 14′ 32″	3198	73° 40′ 44″	3191	75° 7′ 4″	3185
	Pollux	W.	62 8 6	3113	63 36 0	3105	65 4 3	3097	66 32 16	3090
	Regulus	W.	25 6 15	3129	26 33 50	3112	28 1 45	3097	29 29 58	3083
	Spica	E.	29 29 20	3022	27 59 34	3017	26 29 42	3012	24 59 44	3006
	Antares	E.	75 2 56	3038	73 33 30	3032	72 3 57	3026	70 34 17	3022
2	Mars	W.	82 20 34	3153	83 47 39	3146	85 14 53	3139	86 42 15	3132
	Pollux	W.	73 55 41	3051	75 24 51	3043	76 54 10	3035	78 23 39	3028
	Regulus	W.	36 54 58	3026	38 24 39	3015	39 54 33	3005	41 24 39	2996
	Antares	E.	63 4 17	2993	61 33 55	2987	60 3 26	2981	58 32 49	2975
3	Mars	W.	94 1 13	3096	95 29 27	3089	96 57 50	3082	98 26 21	3074
	Pollux	W.	85 53 24	2990	87 23 49	2983	88 54 23	2975	90 25 7	2968
	Regulus	W.	48 58 5	2950	50 29 20	2941	52 0 47	2932	53 32 25	2924
	Antares	E.	50 57 54	2945	49 26 32	2939	47 55 3	2933	46 23 26	2927
	α Aquilæ	E.	103 7 45	3359	101 44 42	3347	100 21 25	3336	98 57 54	3325
4	Mars	W.	105 51 16	3037	107 20 43	3030	108 50 19	3022	110 20 5	3014
	Pollux	W.	98 1 5	2931	99 32 44	2924	101 4 33	2917	102 36 30	2910
	Regulus	W.	61 13 20	2880	62 46 4	2872	64 18 59	2862	65 52 6	2855
	Antares	E.	38 43 39	2902	37 11 23	2898	35 39 1	2894	34 6 34	2891
	α Aquilæ	E.	91 57 18	3275	90 32 37	3267	89 7 47	3260	87 42 49	3253
5	Pollux	W.	110 18 27	2876	111 51 16	2870	113 24 13	2864	114 57 18	2858
	Regulus	W.	73 40 22	2811	75 14 35	2803	76 48 59	2795	78 23 34	2785
	Antares	E.	26 23 38	2888	24 51 4	2892	23 18 35	2899	21 46 15	2910
	α Aquilæ	E.	80 36 5	3225	79 10 26	3221	77 44 42	3219	76 18 55	3216
	Fomalhaut	E.	108 17 55	3316	106 54 2	3299	105 29 49	3283	104 5 18	3268
6	Regulus	W.	86 19 22	2741	87 55 7	2733	89 31 3	2724	91 7 11	2715
	Spica	W.	32 20 13	2723	33 56 22	2715	35 32 42	2706	37 9 14	2696
	α Aquilæ	E.	69 9 32	3215	67 43 41	3218	66 17 53	3222	64 52 10	3226
	Fomalhaut	E.	96 58 27	3200	95 32 18	3189	94 5 56	3179	92 39 22	3169
	Sun	E.	142 32 48	3090	141 4 26	3079	139 35 51	3068	138 7 2	3057
7	Regulus	W.	99 10 52	2669	100 48 13	2660	102 25 47	2651	104 3 33	2641
	Spica	W.	45 15 4	2649	46 52 52	2640	48 30 53	2630	50 9 7	2620
	α Aquilæ	E.	57 45 30	3272	56 20 46	3287	54 56 19	3304	53 32 12	3324
	Fomalhaut	E.	85 23 39	3126	83 56 1	3120	82 28 16	3114	81 0 23	3109
	α Pegasi	E.	103 24 0	2798	101 49 29	2786	100 14 43	2775	98 39 42	2764
	Sun	E.	130 39 35	3002	129 9 25	2991	127 39 1	2980	126 8 23	2969
8	Spica	W.	58 23 40	2570	60 3 16	2560	61 43 6	2550	63 23 10	2540
	α Aquilæ	E.	46 38 29	3473	45 17 35	3516	43 57 29	3566	42 38 18	3623
	Fomalhaut	E.	73 39 43	3095	72 11 27	3094	70 43 10	3094	69 14 53	3096
	α Pegasi	E.	90 41 5	2711	89 4 40	2701	87 28 2	2691	85 51 10	2681
	Sun	E.	118 31 44	2912	116 59 41	2901	115 27 24	2890	113 54 52	2878
9	Spica	W.	71 47 10	2486	73 28 43	2475	75 10 31	2465	76 52 34	2453
	Antares	W.	26 45 10	2572	28 24 44	2551	30 4 46	2533	31 45 13	2516
	α Aquilæ	E.	36 20 40	4059	35 9 58	4189	34 1 22	4340	32 55 6	4516
	Fomalhaut	E.	61 54 37	3127	60 27 0	3138	58 59 36	3151	57 32 28	3167
	α Pegasi	E.	77 43 39	2635	76 5 32	2626	74 27 13	2618	72 48 42	2610

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
9	Sun	E.	112° 22′ 5″	2866	110° 49′ 3″	2855	109° 15′ 47″	2843	107° 42′ 15″	2831
10	Spica	W.	78 34 53	2443	80 17 27	2431	82 0 17	2420	83 43 23	2410
	Antares	W.	33 26 4	2499	35 7 18	2483	36 48 55	2468	38 30 53	2454
	Fomalhaut	E.	56 5 39	3185	54 39 12	3206	53 13 10	3231	51 47 38	3259
	α Pegasi	E.	71 10 1	2602	69 31 9	2595	67 52 7	2588	66 12 56	2582
	Sun	E.	99 50 46	2772	98 15 41	2760	96 40 20	2748	95 4 44	2736
11	Spica	W.	92 22 49	2354	94 7 30	2343	95 52 27	2332	97 37 40	2321
	Antares	W.	47 5 41	2387	48 49 35	2373	50 33 48	2361	52 18 19	2348
	Fomalhaut	E.	44 50 4	3479	43 29 16	3544	42 9 40	3618	40 51 25	3703
	α Pegasi	E.	57 54 59	2558	56 15 6	2555	54 35 9	2553	52 55 10	2553
	Sun	E.	87 2 43	2675	85 25 30	2663	83 48 1	2652	82 10 17	2640
12	Antares	W.	61 5 15	2291	62 51 28	2279	64 37 58	2269	66 24 43	2259
	α Pegasi	E.	44 35 50	2576	42 56 22	2587	41 17 9	2601	39 38 15	2619
	Sun	E.	73 57 40	2583	72 18 22	2572	70 38 49	2561	68 59 1	2551
13	Antares	W.	75 22 11	2211	77 10 22	2202	78 58 46	2194	80 47 23	2186
	α Aquilæ	W.	32 24 38	4147	33 33 54	3955	34 46 18	3789	36 1 32	3644
	Sun	E.	60 36 33	2503	58 55 24	2494	57 14 3	2485	55 32 29	2477
14	Antares	W.	89 53 13	2153	91 42 52	2148	93 32 38	2143	95 22 31	2139
	α Aquilæ	W.	42 51 34	3138	44 18 57	3069	45 47 45	3006	47 17 50	2951
	Sun	E.	47 2 4	2445	45 19 33	2439	43 36 54	2435	41 54 9	2431
15	Antares	W.	104 33 20	2126	106 23 40	2125	108 14 1	2124	110 4 23	2125
	α Aquilæ	W.	55 3 33	2750	56 39 6	2722	58 15 17	2697	59 52 1	2675
	Sun	E.	33 19 16	2421	31 36 11	2422	29 53 7	2423	28 10 5	2425
19	Sun	W.	21 13 11	2697	22 49 55	2708	24 26 24	2721	26 2 36	2735
	Mars	E.	59 50 19	2535	58 9 54	2552	56 29 53	2570	54 50 17	2588
	Pollux	E.	61 11 15	2449	59 28 50	2468	57 46 52	2488	56 5 22	2508
	Regulus	E.	97 40 49	2368	95 56 28	2383	94 12 29	2399	92 28 53	2415
20	Sun	W.	33 58 40	2814	35 32 50	2831	37 6 37	2848	38 40 2	2866
	Mars	E.	46 38 36	2685	45 1 36	2705	43 25 3	2726	41 48 58	2747
	Pollux	E.	47 45 18	2622	46 6 53	2648	44 29 3	2675	42 51 49	2703
	Regulus	E.	83 56 36	2497	82 15 19	2515	80 34 26	2532	78 53 57	2550
21	Sun	W.	46 21 26	2955	47 52 35	2973	49 23 21	2991	50 53 45	3009
	Jupiter	W.	17 45 9	2689	19 22 4	2705	20 58 37	2722	22 34 47	2740
	Mars	E.	33 55 49	2863	32 22 43	2889	30 50 10	2916	29 18 11	2944
	Pollux	E.	34 55 37	2868	33 22 37	2908	31 50 28	2951	30 19 14	2999
	Regulus	E.	70 37 35	2638	68 59 31	2655	67 21 50	2672	65 44 33	2689
22	Sun	W.	58 20 15	3096	59 48 30	3113	61 16 24	3129	62 43 58	3146
	Jupiter	W.	30 30 4	2822	32 4 3	2838	33 37 42	2854	35 11 0	2869
	Aldebaran	W.	22 30 23	2842	24 3 57	2846	25 37 25	2852	27 10 45	2860
	Regulus	E.	57 43 56	2776	56 8 57	2794	54 34 21	2810	53 0 6	2827
	Spica	E.	111 32 3	2747	109 56 25	2763	108 21 8	2778	106 46 11	2793
23	Sun	W.	69 57 0	3223	71 22 42	3236	72 48 8	3251	74 13 17	3265

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	Sun	E.	106° 8′ 28″	2820	104° 34′ 26″	2808	103° 0′ 8″	2796	101° 25′ 35″	2784
10	Spica	W.	85 26 44	2398	87 10 21	2387	88 54 15	2376	90 38 24	2365
	Antares	W.	40 13 11	2439	41 55 50	2426	43 38 48	2412	45 22 5	2399
	Fomalhaut	E.	50 22 39	3293	48 58 19	3330	47 34 42	3373	46 11 55	3423
	α Pegasi	E.	64 33 36	2575	62 54 7	2570	61 14 31	2565	59 34 48	2561
	Sun	E.	93 28 52	2724	91 52 44	2712	90 16 20	2700	88 39 40	2687
11	Spica	W.	99 23 9	2310	101 8 54	2300	102 54 54	2289	104 41 9	2279
	Antares	W.	54 3 8	2337	55 48 14	2324	57 33 38	2313	59 19 18	2302
	Fomalhaut	E.	39 34 41	3801	38 19 40	3914	37 6 34	4044	35 55 38	4195
	α Pegasi	E.	51 15 11	2554	49 35 13	2557	47 55 19	2561	46 15 30	2567
	Sun	E.	80 32 17	2629	78 54 1	2618	77 15 30	2606	75 36 43	2594
12	Antares	W.	68 11 43	2249	69 58 58	2239	71 46 28	2229	73 34 13	2220
	α Pegasi	E.	37 59 46	2641	36 21 47	2669	34 44 26	2703	33 7 50	2744
	Sun	E.	67 18 59	2541	65 38 43	2531	63 58 13	2522	62 17 30	2512
13	Antares	W.	82 36 12	2178	84 25 12	2172	86 14 22	2165	88 3 43	2159
	α Aquilæ	W.	37 19 19	3516	38 39 25	3404	40 1 37	3304	41 25 44	3216
	Sun	E.	53 50 43	2470	52 8 47	2463	50 26 42	2456	48 44 27	2450
14	Antares	W.	97 12 31	2136	99 2 36	2132	100 52 47	2129	102 43 2	2127
	α Aquilæ	W.	48 49 4	2901	50 21 21	2857	51 54 35	2817	53 28 41	2782
	Sun	E.	40 11 18	2427	38 28 22	2424	36 45 22	2423	35 2 20	2422
15	Antares	W.	111 54 44	2126	113 45 4	2128	115 35 21	2130	117 25 34	2133
	α Aquilæ	W.	61 29 15	2655	63 6 55	2639	64 44 57	2624	66 23 19	2612
	Sun	E.	26 27 6	2429	24 44 12	2433	23 1 25	2441	21 18 48	2449
19	Sun	W.	27 38 29	2750	29 14 2	2766	30 49 15	2781	32 24 8	2797
	Mars	E.	53 11 5	2606	51 32 18	2625	49 53 57	2645	48 16 3	2665
	Pollux	E.	54 24 20	2530	52 43 48	2551	51 3 46	2574	49 24 16	2598
	Regulus	E.	90 45 39	2431	89 2 48	2448	87 20 21	2464	85 38 17	2480
20	Sun	W.	40 13 4	2883	41 45 44	2901	43 18 1	2920	44 49 55	2938
	Mars	E.	40 13 21	2769	38 38 13	2792	37 3 35	2815	35 29 27	2838
	Pollux	E.	41 15 13	2732	39 39 16	2763	38 3 59	2795	36 29 25	2831
	Regulus	E.	77 13 53	2567	75 34 13	2584	73 54 56	2601	72 16 3	2620
21	Sun	W.	52 23 46	3027	53 53 25	3044	55 22 43	3062	56 51 39	3078
	Jupiter	W.	24 10 34	2756	25 45 59	2773	27 21 2	2789	28 55 44	2806
	Mars	E.	27 46 48	2973	26 16 2	3005	24 45 55	3039	23 16 31	3078
	Pollux	E.	28 49 0	3052	27 19 52	3112	25 51 57	3181	24 25 25	3259
	Regulus	E.	64 7 39	2707	62 31 8	2725	60 55 1	2742	59 19 17	2760
22	Sun	W.	64 11 12	3162	65 38 7	3178	67 4 43	3193	68 31 0	3208
	Jupiter	W.	36 43 58	2884	38 16 37	2900	39 48 56	2915	41 20 56	2929
	Aldebaran	W.	28 43 55	2869	30 16 54	2878	31 49 41	2887	33 22 16	2898
	Regulus	E.	51 26 13	2843	49 52 41	2860	48 19 31	2876	46 46 41	2892
	Spica	E.	105 11 34	2808	103 37 17	2823	102 3 19	2837	100 29 39	2852
23	Sun	W.	75 38 10	3277	77 2 48	3290	78 27 11	3303	79 51 19	3315

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L of Diff.
23	**Jupiter**	W.	42° 52′ 38″	2942	44° 24′ 3″	2956	45° 55′ 11″	2969	47° 26′ 2″	2982
	Aldebaran	W.	34 54 38	2908	36 26 47	2918	37 58 43	2928	39 30 26	2939
	Regulus	E.	45 14 12	2908	43 42 3	2924	42 10 15	2940	40 38 47	2956
	Spica	E.	98 56 18	2866	97 23 15	2879	95 50 29	2891	94 17 59	2904
24	**Sun**	W.	81 15 13	3326	82 38 54	3337	84 2 23	3347	85 25 40	3357
	Jupiter	W.	54 56 26	3041	56 25 48	3051	57 54 58	3060	59 23 56	3070
	Aldebaran	W.	47 5 50	2988	48 36 18	2996	50 6 36	3005	51 36 43	3013
	Regulus	E.	33 6 25	3036	31 36 57	3053	30 7 50	3071	28 39 5	3090
	Spica	E.	86 39 21	2962	85 8 20	2971	83 37 31	2981	82 6 54	2990
25	**Sun**	W.	92 19 26	3400	93 41 43	3407	95 3 52	3413	96 25 54	3419
	Jupiter	W.	66 46 2	3110	68 13 59	3117	69 41 48	3124	71 9 29	3129
	Aldebaran	W.	59 4 55	3048	60 34 8	3055	62 3 13	3060	63 32 12	3065
	Mars	W.	15 41 35	3555	17 0 59	3510	18 21 12	3476	19 42 3	3449
	Spica	E.	74 36 33	3030	73 6 57	3036	71 37 29	3043	70 8 9	3047
26	**Sun**	W.	103 14 35	3440	104 36 6	3443	105 57 34	3446	107 18 59	3447
	Jupiter	W.	78 26 27	3149	79 53 37	3153	81 20 43	3154	82 47 47	3156
	Aldebaran	W.	70 55 45	3083	72 24 15	3086	73 52 42	3087	75 21 7	3089
	Pollux	W.	30 11 24	3376	31 34 8	3354	32 57 17	3334	34 20 49	3316
	Mars	W.	26 31 57	3379	27 54 38	3371	29 17 28	3364	30 40 26	3358
	Spica	E.	62 42 56	3069	61 14 8	3071	59 45 23	3073	58 16 40	3074
	Antares	E.	108 8 5	3087	106 39 40	3089	105 11 17	3091	103 42 57	3093
27	**Sun**	W.	114 5 44	3448	115 27 6	3447	116 48 29	3446	118 9 53	3445
	Jupiter	W.	90 2 45	3158	91 29 44	3157	92 56 45	3155	94 23 48	3153
	Aldebaran	W.	82 42 54	3090	84 11 16	3089	85 39 39	3087	87 8 4	3085
	Pollux	W.	41 22 58	3251	42 48 7	3240	44 13 29	3231	45 39 2	3220
	Mars	W.	37 36 54	3332	39 0 29	3327	40 24 9	3322	41 47 55	3317
	Spica	E.	50 53 27	3077	49 24 49	3076	47 56 10	3074	46 27 29	3072
	Antares	E.	96 21 33	3093	94 53 15	3092	93 24 56	3091	91 56 36	3090
28	**Sun**	W.	124 57 37	3428	126 19 22	3423	127 41 13	3418	129 3 9	3413
	Jupiter	W.	101 39 44	3138	103 7 7	3133	104 34 36	3129	106 2 10	3124
	Aldebaran	W.	94 30 54	3070	95 59 40	3066	97 28 31	3061	98 57 28	3057
	Pollux	W.	52 49 34	3176	53 16 12	3168	54 43 0	3158	56 9 59	3150
	Mars	W.	48 48 14	3290	50 12 37	3283	51 37 8	3277	53 1 46	3271
	Spica	E.	39 3 21	3058	37 34 20	3054	36 5 14	3049	34 36 2	3044
	Antares	E.	84 34 11	3074	83 5 30	3070	81 36 44	3065	80 7 52	3060
29	**Jupiter**	W.	113 21 39	3094	114 49 56	3087	116 18 21	3080	117 46 55	3073
	Aldebaran	W.	106 23 47	3028	107 53 25	3022	109 23 11	3014	110 53 6	3008
	Pollux	W.	64 27 29	3106	65 55 31	3097	67 23 44	3088	68 52 8	3079
	Mars	W.	60 6 54	3236	61 32 21	3227	62 57 58	3219	64 23 45	3210
	Regulus	W.	27 25 14	3110	28 53 11	3095	30 21 27	3080	31 50 1	3066
	Antares	E.	72 41 58	3033	71 12 26	3026	69 42 46	3019	68 12 57	3013
30	Pollux	W.	76 16 59	3032	77 46 32	3022	79 16 17	3013	80 46 14	3003
	Mars	W.	71 35 12	3167	73 2 1	3157	74 29 2	3147	75 56 15	3138
	Regulus	W.	39 16 57	3003	40 47 7	2991	42 17 31	2979	43 48 10	2968
	Antares	E.	60 41 40	2975	59 10 56	2968	57 40 3	2959	56 8 59	2951

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Jupiter	W.	48° 56′ 37″	2995	50° 26′ 56″	3007	51° 57′ 0″	3018	53° 26′ 50″	3030
	Aldebaran	W.	41 1 56	2949	42 33 13	2958	44 4 18	2969	45 35 10	2978
	Regulus	E.	39 7 39	2972	37 36 51	2987	36 6 22	3003	34 36 13	3020
	Spica	E.	92 45 45	2916	91 13 47	2928	89 42 4	2939	86 10 35	2951
24	Sun	W.	86 48 46	3366	88 11 41	3376	89 34 25	3384	90 57 0	3392
	Jupiter	W.	60 52 42	3079	62 21 17	3087	63 49 42	3096	65 17 57	3104
	Aldebaran	W.	53 6 40	3021	54 36 27	3028	56 6 5	3035	57 35 34	3042
	Regulus	E.	27 10 43	3110	25 42 45	3130	24 15 12	3153	22 48 6	3178
	Spica	E.	80 36 29	2999	79 6 15	3007	77 36 11	3015	76 6 17	3023
25	Sun	W.	97 47 49	3424	99 9 38	3429	100 31 22	3433	101 53 1	3438
	Jupiter	W.	72 37 4	3134	74 4 32	3138	75 31 55	3143	76 59 13	3146
	Aldebaran	W.	65 1 5	3069	66 29 52	3073	67 58 34	3077	69 27 12	3081
	Mars	W.	21 3 24	3429	22 25 8	3413	23 47 10	3400	25 9 27	3388
	Spica	E.	68 38 55	3052	67 9 47	3057	65 40 45	3061	64 11 48	3065
26	Sun	W.	108 40 22	3440	110 1 43	3450	111 23 3	3450	112 44 23	3449
	Jupiter	W.	84 14 49	3158	85 41 49	3158	87 8 48	3159	88 35 46	3158
	Aldebaran	W.	76 49 30	3091	78 17 51	3091	79 46 12	3091	81 14 33	3091
	Pollux	W.	35 44 42	3300	37 8 53	3287	38 33 20	3274	39 58 2	3262
	Mars	W.	32 3 31	3351	33 26 43	3346	34 50 1	3341	36 13 25	3337
	Spica	E.	56 47 59	3076	55 19 20	3077	53 50 42	3078	52 22 5	3077
	Antares	E.	102 14 39	3094	100 46 22	3095	99 18 6	3095	97 49 50	3094
27	Sun	W.	119 31 19	3442	120 52 48	3438	122 14 21	3436	123 35 57	3432
	Jupiter	W.	95 50 53	3151	97 18 1	3148	98 45 12	3146	100 12 26	3143
	Aldebaran	W.	88 36 32	3083	90 5 2	3080	91 33 36	3078	93 2 13	3074
	Pollux	W.	47 4 47	3211	48 30 43	3203	49 56 49	3193	51 23 6	3184
	Mars	W.	43 11 47	3312	44 35 45	3307	45 59 48	3301	47 23 58	3296
	Spica	E.	44 58 45	3069	43 29 58	3068	42 1 9	3065	40 32 17	3062
	Antares	E.	90 28 14	3087	88 59 49	3084	87 31 20	3082	86 2 48	3078
28	Sun	W.	130 25 11	3407	131 47 20	3401	133 9 35	3394	134 31 58	3388
	Jupiter	W.	107 29 50	3119	108 57 36	3114	110 25 29	3107	111 53 30	3101
	Aldebaran	W.	100 26 30	3052	101 55 39	3047	103 24 54	3040	104 54 17	3034
	Pollux	W.	58 37 8	3142	60 4 27	3133	61 31 57	3124	62 59 38	3115
	Mars	W.	54 26 31	3265	55 51 24	3257	57 16 26	3250	58 41 36	3243
	Spica	E.	33 6 44	3039	31 37 20	3034	30 7 50	3029	28 38 13	3022
	Antares	E.	78 38 54	3056	77 9 50	3051	75 40 40	3045	74 11 23	3039
29	Jupiter	W.	119 15 38	3065	120 44 30	3057	122 13 32	3048	123 42 45	3039
	Aldebaran	W.	112 23 9	3001	113 53 21	2993	115 23 43	2985	116 54 14	2977
	Pollux	W.	70 20 43	3069	71 49 30	3060	73 18 28	3051	74 47 38	3042
	Mars	W.	65 49 42	3202	67 15 49	3193	68 42 6	3184	70 8 34	3176
	Regulus	W.	33 18 52	3053	34 47 59	3039	36 17 23	3027	37 47 2	3014
	Antares	E.	66 43 0	3005	65 12 54	2998	63 42 39	2590	62 12 14	2983
30	Pollux	W.	82 16 23	2993	83 46 44	2983	85 17 18	2973	86 48 4	2963
	Mars	W.	77 23 39	3128	78 51 15	3118	80 19 3	3108	81 47 3	3097
	Regulus	W.	45 19 3	2956	46 50 11	2945	48 21 33	2934	49 53 9	2922
	Antares	E.	54 37 45	2943	53 6 21	2935	51 34 46	2927	50 3 1	2919

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	2 34 11.79	9.540	N.15 7 44.3	+45.25	15 54.23	66.07	3 2.65	0.316
Tues.	2	2 38 1.03	9.563	15 25 42.9	44.63	15 54.00	66.15	3 9.94	0.293
Wed.	3	2 41 50.82	9.586	15 43 26.2	43.98	15 53.77	66.23	3 16.69	0.270
Thur.	4	2 45 41.17	9.610	16 0 54.0	+43.32	15 53.54	66.31	3 22.88	0.246
Frid.	5	2 49 32.09	9.633	16 18 5.9	42.66	15 53.31	66.39	3 28.50	0.223
Sat.	6	2 53 23.59	9.657	16 35 1.7	41.99	15 53.08	66.47	3 33.55	0.199
SUN.	7	2 57 15.65	9.682	16 51 41.1	+41.29	15 52.85	66.55	3 38.02	0.175
Mon.	8	3 1 8.30	9 707	17 8 3.6	40.58	15 52.63	66.64	3 41 91	0.150
Tues.	9	3 5 1.54	9.732	17 24 9.1	39.87	15 52.41	66.72	3 45.22	0.125
Wed.	10	3 8 55.38	9.757	17 39 57.1	+39.14	15 52.19	66.80	3 47.93	0.100
Thur.	11	3 12 49.82	9.782	17 55 27.6	38.40	15 51.97	66.88	3 50.03	0.075
Frid.	12	3 16 44.87	9.806	18 10 40.2	37.64	15 51.76	66.97	3 51.54	0.051
Sat.	13	3 20 40.50	9.831	18 25 34.5	+36.88	15 51.55	67.05	3 52.46	0.026
SUN.	14	3 24 36.72	9.855	18 40 10.3	36.10	15 51.35	67.13	3 52.79	0.002
Mon.	15	3 28 33.53	9.879	18 54 27.1	35.30	15 51.15	67.21	3 52.53	0.022
Tues.	16	3 32 30.92	9.903	19 8 24.9	+34.49	15 50.95	67.29	3 51.70	0.046
Wed.	17	3 36 28.88	9.927	19 22 3.2	33.68	15 50.76	67.37	3 50.30	0.070
Thur.	18	3 40 27.41	9.950	19 35 22.0	32.86	15 50.58	67.45	3 48.33	0.093
Frid.	19	3 44 26 48	9.973	19 48 20.7	+32.02	15 50.39	67.53	3 45.82	0.116
Sat.	20	3 48 26.11	9.996	20 0 59.2	31.17	15 50.21	67.61	3 42.77	0.139
SUN.	21	3 52 26.28	10.018	20 13 17.1	30.32	15 50.04	67.69	3 39.17	0.161
Mon.	22	3 56 26.97	10.040	20 25 14.4	+29.45	15 49.87	67.76	3 35.04	0.182
Tues.	23	4 0 28.15	10.061	20 36 50.7	28.56	15 49.70	67.84	3 30.42	0.203
Wed.	24	4 4 29.83	10.081	20 48 5.8	27.67	15 49.54	67.91	3 25.31	0.223
Thur.	25	4 8 32.01	10.101	20 58 59.4	+26.77	15 49.38	67.98	3 19.70	0.243
Frid.	26	4 12 34.67	10.121	21 9 31.5	25.87	15 49.23	68.05	3 13.61	0.263
Sat.	27	4 16 37.80	10.140	21 19 41.6	24.95	15 49.08	68.12	3 7.06	0.282
SUN.	28	4 20 41.38	10.159	21 29 29.6	+24.03	15 48.93	68.18	3 0.06	0.301
Mon.	29	4 24 45.41	10.177	21 38 55.3	23.10	15 48.78	68.25	2 52.61	0.319
Tues.	30	4 28 49.88	10.195	21 47 58.4	22.16	15 48.64	68.31	2 44.72	0.337
Wed.	31	4 32 54.77	10.212	21 56 38.9	21.21	15 48.50	68.37	2 36.40	0.354
Thur.	32	4 37 0.09	10.230	N.22 4 56.5	+20.26	15 48.37	68.43	2 27.67	0.372

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	2 34 12.27	9.541	N. 15 7 46.6	+45.25	3 2.67	0.316	2 37 14.94
Tues.	2	2 38 1.53	9.564	15 25 45.2	44.63	3 9.96	0.293	2 41 11.49
Wed.	3	2 41 51.34	9.587	15 43 28.6	43.98	3 16.71	0.270	2 45 8.05
Thur.	4	2 45 41.71	9.611	16 0 56.4	+43.32	3 22.89	0.246	2 49 4.60
Frid.	5	2 49 32.65	9.634	16 18 8.3	42.66	3 28.51	0.223	2 53 1.16
Sat.	6	2 53 24.16	9.658	16 35 4.1	41.99	3 33.55	0.199	2 56 57.71
SUN.	7	2 57 16.24	9.682	16 51 43.6	+41.29	3 38.03	0.175	3 0 54.27
Mon.	8	3 1 8.90	9.707	17 8 6.1	40.58	3 41.92	0.150	3 4 50.82
Tues.	9	3 5 2.15	9.732	17 24 11.6	39.87	3 45.23	0.125	3 8 47.38
Wed.	10	3 8 56.00	9.757	17 39 59.6	+39.14	3 47.93	0.100	3 12 43.93
Thur.	11	3 12 50.45	9.782	17 55 30.1	38.40	3 50.04	0.075	3 16 40.49
Frid.	12	3 16 45.50	9.806	18 10 42.6	37.64	3 51.54	0.051	3 20 37.04
Sat.	13	3 20 41.14	9.831	18 25 36.9	+36.88	3 52 46	0.026	3 24 33.60
SUN.	14	3 24 37.36	9.855	18 40 12.6	36.10	3 52.79	0.002	3 28 30.15
Mon.	15	3 28 34.17	9.879	18 54 29.4	35.30	3 52.54	0.022	3 32 26.71
Tues.	16	3 32 31.56	9.903	19 8 27.1	+34.49	3 51.70	0.046	3 36 23.26
Wed.	17	3 36 29.52	9.927	19 22 5.4	33.68	3 50.30	0.070	3 40 19.82
Thur.	18	3 40 28.04	9.950	19 35 24.1	32.86	3 48.33	0.093	3 44 16.37
Frid.	19	3 44 27.11	9.973	19 48 22.7	+32.02	3 45.82	0.116	3 48 12.93
Sat.	20	3 48 26.73	9.996	20 1 1.1	31.17	3 42.76	0.139	3 52 9.49
SUN.	21	3 52 26.89	10.018	20 13 19.0	30.32	3 39.16	0.161	3 56 6.05
Mon.	22	3 56 27.57	10.039	20 25 16.2	+29.45	3 35.03	0.182	4 0 2.60
Tues.	23	4 0 28.74	10.060	20 36 52.4	28.56	3 30.42	0.203	4 3 59.16
Wed.	24	4 4 30.41	10.080	20 48 7.4	27.67	3 25.30	0.223	4 7 55.71
Thur.	25	4 8 32.58	10.100	20 59 0.9	+26.77	3 19.69	0.243	4 11 52.27
Frid.	26	4 12 35.22	10.120	21 9 32.9	25.87	3 13.60	0.263	4 15 48.82
Sat.	27	4 16 38.33	10.139	21 19 42.9	24.95	3 7.05	0.282	4 19 45.38
SUN.	28	4 20 41.89	10.158	21 29 30.8	+24.03	3 0.05	0.301	4 23 41.94
Mon.	29	4 24 45.90	10.176	21 38 56.4	23.10	2 52.60	0.319	4 27 38.50
Tues.	30	4 28 50.34	10.194	21 47 59.4	22.16	2 44.71	0.337	4 31 35.05
Wed.	31	4 32 55.21	10.211	21 56 39.8	21.21	2 36.40	0.354	4 35 31.61
Thur.	32	4 37 0.50	10.229	N. 22 4 57.3	+20.26	2 27.66	0.372	4 39 28.16

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, + 9^{s}.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	121	40 59 6.4	58 35.7	145.38	− 0.30	0.0035207	+ 44.3	21 19 14.91
2	122	41 57 14.8	56 44.0	145.31	0.20	0.0036268	44.1	21 15 19.00
3	123	42 55 21.4	54 50.5	145.24	− 0.07	0.0037324	43.9	21 11 23.10
4	124	43 53 26.4	52 55.3	145.17	+ 0.07	0.0038373	+ 43.6	21 7 27.19
5	125	44 51 29.8	50 58.6	145.11	0.20	0.0039417	43.4	21 3 31.28
6	126	45 49 31.7	49 0.4	145.05	0.31	0.0040455	43.1	20 59 35.37
7	127	46 47 32.3	47 0.9	144.99	+ 0.41	0.0041485	+ 42.7	20 55 39.46
8	128	47 45 31.5	45 0.0	144.94	0.48	0.0042507	42.3	20 51 43.55
9	129	48 43 29.4	42 57.7	144.88	0.54	0.0043518	41.8	20 47 47.64
10	130	49 41 26.0	40 54.2	144.83	+ 0.56	0.0044517	+ 41.3	20 43 51.73
11	131	50 39 21.4	38 49.4	144.77	0.56	0.0045502	40.7	20 39 55.83
12	132	51 37 15.4	36 43.3	144.72	0 53	0.0046472	40.1	20 35 59.92
13	133	52 35 8.2	34 36.0	144.67	+ 0.45	0.0047425	+ 39.4	20 32 4.01
14	134	53 32 59.7	32 27.3	144.62	0.37	0.0048360	38.6	20 28 8.10
15	135	54 30 50.0	30 17.4	144.56	0.25	0.0049276	37.8	20 24 12.19
16	136	55 28 39.0	28 6.3	144.51	+ 0.12	0.0050174	+ 37.0	20 20 16.28
17	137	56 26 26.7	25 53.9	144.46	− 0.02	0.0051051	36.1	20 16 20.37
18	138	57 24 13.0	23 40.1	144.40	0.15	0.0051906	35.2	20 12 24.46
19	139	58 21 57.9	21 24.8	144.34	− 0.29	0.0052739	+ 34.4	20 8 28.54
20	140	59 19 41.4	19 8.1	144.28	0.42	0.0053552	33.5	20 4 32.63
21	141	60 17 23.3	16 49.9	144.21	0.51	0.0054345	32.6	20 0 36.72
22	142	61 15 3.7	14 30.2	144.15	− 0.60	0.0055117	+ 31.8	19 56 40.81
23	143	62 12 42.6	12 8.9	144.09	0.66	0.0055870	31.0	19 52 44.91
24	144	63 10 20.1	9 46.2	144.03	0.68	0.0056605	30.3	19 48 49.00
25	145	64 7 56.1	7 22.0	143.97	− 0.67	0.0057323	+ 29.6	19 44 53.09
26	146	65 5 30.6	4 56.4	143.91	0.63	0.0058025	28.9	19 40 57.18
27	147	66 3 3.7	2 29.4	143.85	0.57	0.0058711	28.3	19 37 1.26
28	148	67 0 35.5	0 1.0	143.80	− 0.48	0.0059383	+ 27.7	19 33 5.35
29	149	67 58 6.1	57 31.4	143.74	0.38	0.0060043	27.2	19 29 9.44
30	150	68 55 35.4	55 0.5	143.69	0.26	0.0060692	26.8	19 25 13.53
31	151	69 53 3.5	52 28.5	143.64	− 0.13	0.0061329	26.3	19 21 17.62
32	152	70 50 30.6	49 55.5	143.60	0.00	0.0061953	+ 25.7	19 17 21.70

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 4.0	15 7.9	55 11.0	+ 1.14	55 25.2	+ 1.21	10 49.5	1.93	13.6
2	15 12.0	15 16.2	55 40.1	1.26	55 55.5	1.29	11 37.1	2.04	14.6
3	15 20.4	15 24.7	56 11.1	1.30	56 26.8	1.31	12 27.4	2.16	15.6
4	15 29.0	15 33.2	56 42.5	+ 1.30	56 58.0	+ 1.28	13 20.5	2.26	16.6
5	15 37.3	15 41.3	57 13.1	1.24	57 27.8	1.20	14 15.5	2.32	17.6
6	15 45.2	15 48.9	57 42.0	1.16	57 55.7	1.11	15 11.5	2.33	18.6
7	15 52.4	15 55.8	58 8.7	+ 1.05	58 21.0	+ 1.00	16 7.2	2.30	19.6
8	15 59.0	16 2.0	58 32.7	0.95	58 43.7	0.89	17 1.8	2.24	20.6
9	16 4.7	16 7.3	58 53.9	0.82	59 3.3	0.74	17 55.0	2.18	21.6
10	16 9.6	16 11.6	59 11.7	+ 0.66	59 19.1	+ 0.57	18 47.0	2.14	22.6
11	16 13.3	16 14.6	59 25.3	0.46	59 30.1	0.33	19 38.2	2.13	23.6
12	16 15.4	16 15.8	59 33.2	+ 0.19	59 34.6	+ 0.03	20 29.6	2.15	24.6
13	16 15.7	16 14.9	59 34.0	− 0.14	59 31.3	− 0.32	21 21.7	2.20	25.6
14	16 13.6	16 11.6	59 26.4	0.51	59 19.1	0.70	22 15.2	2.26	26.6
15	16 9.0	16 5.7	59 9.5	0.89	58 57.6	1.08	23 10.2	2.31	27.6
16	16 1.9	15 57.6	58 43.6	− 1.25	58 27.5	− 1.41	☌		28.6
17	15 52.7	15 47.5	58 9.7	1.54	57 50.5	1.64	0 6.1	2.33	0.2
18	15 42.0	15 36.2	57 30.2	1.72	57 9.2	1.76	1 2.1	2.31	1.2
19	15 30.5	15 24.7	56 48.0	− 1.76	56 26.9	− 1.74	1 56.9	2.24	2.2
20	15 19.0	15 13.7	56 6.3	1.69	55 46.6	1.58	2 49.5	2.13	3.2
21	15 8.7	15 4.1	55 28.2	1.47	55 11.3	1.33	3 39.2	2.01	4.2
22	15 0.0	14 56.5	54 56.3	− 1.16	54 43.3	− 0.98	4 26.1	1 90	5.2
23	14 53 6	14 51.3	54 32.6	0.79	54 24.2	0.59	5 10.5	1.81	6.2
24	14 49.7	14 48.8	54 18.3	− 0.38	54 15.0	− 0.16	5 53.2	1.75	7.2
25	14 48.6	14 49.2	54 14.4	+ 0.07	54 16.4	+ 0.28	6 34.8	1.72	8.2
26	14 50.4	14 52.3	54 20.9	0.48	54 27.9	0.67	7 16.3	1.74	9.2
27	14 54.8	14 58.0	54 37.2	0.86	54 48.7	1.04	7 58.6	1.79	10.2
28	15 1.7	15 5.8	55 2.2	+ 1.20	55 17.5	+ 1.33	8 42.6	1.88	11.2
29	15 10.4	15 15.3	55 34.3	1.45	55 52.4	1.54	9 29.0	2.00	12.2
30	15 20.5	15 25.7	56 11.3	1.60	56 30.7	1.63	10 18.4	2.13	13.2
31	15 31.1	15 36.4	56 50.4	1.63	57 9.9	1.60	11 10.9	2,25	14.2
32	15 41.6	15 46.6	57 28.9	+ 1.55	57 47.1	+ 1.47	12 6.2	2.35	15.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 6 45.20	1.9895	S.10 46 29.2	9.782	0	14 46 57.66	2.1923	S.17 32 43.9	6.783
1	13 8 44.68	1.9932	10 56 14.9	9.741	1	14 49 9.33	2.1968	17 39 28.3	6.697
2	13 10 44.38	1.9969	11 5 58.1	9.699	2	14 51 21.27	2.2012	17 46 7.6	6.611
3	13 12 44.31	2.0007	11 15 38.8	9.657	3	14 53 33.47	2.2055	17 52 41.6	6.523
4	13 14 44.46	2.0044	11 25 16.9	9.613	4	14 55 45.93	2.2099	17 59 10.3	6.434
5	13 16 44.84	2.0082	11 34 52.4	9.569	5	14 57 58.66	2.2143	18 5 33.7	6.345
6	13 18 45.45	2.0121	11 44 25.2	9.524	6	15 0 11.65	2.2187	18 11 51.7	6.255
7	13 20 46.29	2.0159	11 53 55.3	9.477	7	15 2 24.90	2.2230	18 18 4.3	6.163
8	13 22 47.36	2.0198	12 3 22.5	9.430	8	15 4 38.41	2.2273	18 24 11.3	6.070
9	13 24 48.67	2.0238	12 12 46.9	9.382	9	15 6 52.18	2.2316	18 30 12.7	5.977
10	13 26 50.22	2.0277	12 22 8.4	9.334	10	15 9 6.21	2.2359	18 36 8.5	5.883
11	13 28 52.00	2.0317	12 31 27.0	9.284	11	15 11 20.49	2.2402	18 41 58.7	5.788
12	13 30 54.02	2.0357	12 40 42.5	9.233	12	15 13 35.03	2.2444	18 47 43.1	5.692
13	13 32 56.28	2.0397	12 49 54.9	9.182	13	15 15 49.82	2.2486	18 53 21.7	5.595
14	13 34 58.79	2.0439	12 59 4.3	9.130	14	15 18 4.86	2.2528	18 58 54.5	5.497
15	13 37 1.55	2.0481	13 8 10.5	9.077	15	15 20 20.16	2.2570	19 4 21.4	5.399
16	13 39 4.56	2.0522	13 17 13.5	9.022	16	15 22 35.70	2.2611	19 9 42.4	5.300
17	13 41 7.81	2.0563	13 26 13.2	8.967	17	15 24 51.49	2.2652	19 14 57.4	5.199
18	13 43 11.31	2.0604	13 35 9.5	8.910	18	15 27 7.53	2.2693	19 20 6.3	5.098
19	13 45 15.06	2.0646	13 44 2.4	8.853	19	15 29 23.81	2.2733	19 25 9.1	4.996
20	13 47 19.07	2.0689	13 52 51.9	8.796	20	15 31 40.33	2.2773	19 30 5.8	4.893
21	13 49 23.33	2.0732	14 1 37.9	8.737	21	15 33 57.08	2.2812	19 34 56.3	4.789
22	13 51 27.85	2.0774	14 10 20.3	8.677	22	15 36 14.07	2.2851	19 39 40.5	4.684
23	13 53 32.62	2.0817	S.14 18 59.1	8.617	23	15 38 31.29	2.2890	S.19 44 18.4	4.579
	TUESDAY 2.					THURSDAY 4.			
0	13 55 37.65	2.0860	S.14 27 34.3	8.555	0	15 40 48.75	2.2929	S.19 48 50.0	4.473
1	13 57 42.94	2.0903	14 36 5.7	8.492	1	15 43 6.44	2.2967	19 53 15.2	4.366
2	13 59 48.49	2.0947	14 44 33.3	8.428	2	15 45 24.35	2.3004	19 57 33.9	4.258
3	14 1 54.30	2.0990	14 52 57.0	8.363	3	15 47 42.48	2.3041	20 1 46.2	4.150
4	14 4 0.37	2.1033	15 1 16.8	8.298	4	15 50 0.83	2.3078	20 5 51.9	4.040
5	14 6 6.70	2.1077	15 9 32.7	8.232	5	15 52 19.41	2.3115	20 9 51.0	3.930
6	14 8 13.30	2.1122	15 17 44.6	8.164	6	15 54 38.21	2.3151	20 13 43.5	3.819
7	14 10 20.16	2.1166	15 25 52.4	8.095	7	15 56 57.22	2.3185	20 17 29.3	3.708
8	14 12 27.29	2.1210	15 33 56.0	8.025	8	15 59 16.43	2.3219	20 21 8.4	3.596
9	14 14 34.68	2.1254	15 41 55.4	7.955	9	16 1 35.85	2.3254	20 24 40.8	3.483
10	14 16 42.34	2.1299	15 49 50.6	7.883	10	16 3 55.48	2.3288	20 28 6.4	3.369
11	14 18 50.27	2.1343	15 57 41.4	7.811	11	16 6 15.31	2.3321	20 31 25.1	3.254
12	14 20 58.46	2.1387	16 5 27.9	7.738	12	16 8 35.33	2.3354	20 34 36.9	3.139
13	14 23 6.92	2.1432	16 13 10.0	7.664	13	16 10 55.55	2.3386	20 37 41.8	3.023
14	14 25 15.65	2.1477	16 20 47.6	7.588	14	16 13 15.96	2.3417	20 40 39.7	2.907
15	14 27 24.64	2.1521	16 28 20.6	7.512	15	16 15 36.55	2.3448	20 43 30.7	2.791
16	14 29 33.90	2.1566	16 35 49.0	7.435	16	16 17 57.33	2.3478	20 46 14.6	2.673
17	14 31 43.43	2.1612	16 43 12.8	7.357	17	16 20 18.29	2.3508	20 48 51.4	2.554
18	14 33 53.24	2.1657	16 50 31.8	7.278	18	16 22 39.42	2.3537	20 51 21.1	2.436
19	14 36 3.31	2.1701	16 57 46.1	7.198	19	16 25 0.73	2.3565	20 53 43.7	2.317
20	14 38 13.65	2.1745	17 4 55.6	7.117	20	16 27 22.20	2.3593	20 55 59.1	2 197
21	14 40 24.25	2.1789	17 12 0.1	7.034	21	16 29 43.84	2.3620	20 58 7.3	2.076
22	14 42 35.12	2.1834	17 18 59.7	6.951	22	16 32 5.64	2.3646	21 0 8.2	1.954
23	14 44 46.26	2.1878	17 25 54.3	6.868	23	16 34 27.59	2.3672	21 2 1.8	1.833
24	14 46 57.66	2.1923	S.17 32 43.9	6.783	24	16 36 49.70	2.3697	S.21 3 48.2	1.712

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 5.					SUNDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 36 49.70	2.3697	S.21 3 48.2	1.712	0	18 32 5.80	2.4050	S.20 0 14.6	4.375
1	16 39 11.96	2.3722	21 5 27.2	1.589	1	18 34 30.07	2.4041	19 55 48.4	4.499
2	16 41 34.36	2.3746	21 6 58.8	1.466	2	18 36 54.29	2.4032	19 51 14.8	4.623
3	16 43 56.91	2.3769	21 8 23.1	1.342	3	18 39 18.45	2.4021	19 46 33.7	4.746
4	16 46 19.59	2.3791	21 9 39.9	1.218	4	18 41 42.54	2.4009	19 41 45.3	4.868
5	16 48 42.40	2.3813	21 10 49.3	1.095	5	18 44 6.55	2.3996	19 36 49.6	4.990
6	16 51 5.34	2.3834	21 11 51.3	0.971	6	18 46 30.49	2.3984	19 31 46.5	5.112
7	16 53 28.41	2.3854	21 12 45.8	0.845	7	18 48 54.36	2.3971	19 26 36.1	5.233
8	16 55 51.59	2.3873	21 13 32.7	0.719	8	18 51 18.14	2.3957	19 21 18.5	5.353
9	16 58 14.89	2.3892	21 14 12.1	0.594	9	18 53 41.84	2.3943	19 15 53.7	5.473
10	17 0 38.30	2.3910	21 14 44.0	0.468	10	18 56 5.46	2.3929	19 10 21.7	5.593
11	17 3 1.81	2.3927	21 15 8.3	0.342	11	18 58 28.99	2.3913	19 4 42.6	5.712
12	17 5 25.43	2.3944	21 15 25.0	0.215	12	19 0 52.42	2.3897	18 58 56.3	5.830
13	17 7 49.14	2.3960	21 15 34.1	− 0.088	13	19 3 15.76	2.3882	18 53 3.0	5.948
14	17 10 12.95	2.3976	21 15 35.6	+ 0.038	14	19 5 39.00	2.3866	18 47 2.6	6.065
15	17 12 36.85	2.3990	21 15 29.5	0.166	15	19 8 2.15	2.3849	18 40 55.2	6.181
16	17 15 0.83	2.4004	21 15 15.7	0.294	16	19 10 25.19	2.3831	18 34 40.9	6.297
17	17 17 24.89	2.4017	21 14 54.2	0.423	17	19 12 48.12	2.3814	18 28 19.6	6.412
18	17 19 49.03	2.4029	21 14 25.0	0.551	18	19 15 10.95	2.3796	18 21 51.4	6.527
19	17 22 13.24	2.4040	21 13 48.1	0.678	19	19 17 33.67	2.3777	18 15 16.4	6.640
20	17 24 37.51	2.4050	21 13 3.6	0.806	20	19 19 56.28	2.3758	18 8 34.6	6.753
21	17 27 1.84	2.4060	21 12 11.4	0.934	21	19 22 18.77	2.3739	18 1 46.0	6.866
22	17 29 26.23	2.4070	21 11 11.5	1.063	22	19 24 41.15	2.3720	17 54 50.7	6.977
23	17 31 50.68	2.4078	S.21 10 3.9	1.192	23	19 27 3.41	2.3700	S.17 47 48.8	7.088
	SATURDAY 6.					MONDAY 8.			
0	17 34 15.17	2.4085	S.21 8 48.5	1.321	0	19 29 25.55	2.3680	S.17 40 40.2	7.198
1	17 36 39.70	2.4092	21 7 25.4	1.449	1	19 31 47.57	2.3660	17 33 25.0	7.307
2	17 39 4.27	2.4098	21 5 54.6	1.577	2	19 34 9.47	2.3639	17 26 3.3	7.415
3	17 41 28.88	2.4104	21 4 16.1	1.706	3	19 36 31.24	2.3618	17 18 35.2	7.523
4	17 43 53.52	2.4108	21 2 29.9	1.835	4	19 38 52.88	2.3597	17 11 0.6	7.630
5	17 46 18.18	2.4112	21 0 35.9	1.964	5	19 41 14.40	2.3576	17 3 19.6	7.737
6	17 48 42.86	2.4115	20 58 34.2	2.092	6	19 43 35.79	2.3554	16 55 32.2	7.842
7	17 51 7.56	2.4117	20 56 24.8	2.221	7	19 45 57.05	2.3532	16 47 38.6	7.946
8	17 53 32.27	2.4118	20 54 7.7	2.349	8	19 48 18.18	2.3510	16 39 38.7	8.050
9	17 55 56.98	2.4119	20 51 42.9	2.478	9	19 50 39.17	2.3488	16 31 32.6	8.152
10	17 58 21.70	2.4120	20 49 10.4	2.606	10	19 53 0.03	2.3466	16 23 20.4	8.254
11	18 0 46.42	2.4120	20 46 30.2	2.733	11	19 55 20.76	2.3444	16 15 2.1	8.355
12	18 3 11.14	2.4119	20 43 42.4	2.861	12	19 57 41.36	2.3422	16 6 37.8	8.455
13	18 5 35.85	2.4117	20 40 46.9	2.989	13	20 0 1.82	2.3399	15 58 7.5	8.554
14	18 8 0.54	2.4113	20 37 43.7	3.117	14	20 2 22.14	2.3376	15 49 31.3	8.652
15	18 10 25.21	2.4110	20 34 32.9	3.243	15	20 4 42.33	2.3353	15 40 49.2	8.750
16	18 12 49.86	2.4106	20 31 14.5	3.370	16	20 7 2.38	2.3330	15 32 1.3	8.846
17	18 15 14.48	2.4102	20 27 48.5	3.497	17	20 9 22.29	2.3307	15 23 7.7	8.942
18	18 17 39.08	2.4096	20 24 14.8	3.624	18	20 11 42.06	2.3284	15 14 8.3	9.037
19	18 20 3.64	2.4090	20 20 33.6	3.750	19	20 14 1.69	2.3261	15 5 3.2	9.131
20	18 22 28.16	2.4084	20 16 44.8	3.876	20	20 16 21.19	2.3238	14 55 52.6	9.222
21	18 24 52.64	2.4077	20 12 48.5	4.001	21	20 18 40.55	2.3215	14 46 36.6	9.313
22	18 27 17.08	2.4069	20 8 44.7	4.196	22	20 20 59.77	2.3192	14 37 15.1	9.404
23	18 29 41.47	2.4060	20 4 33.4	4.251	23	20 23 18.85	2.3169	14 27 48.1	9.494
24	18 32 5.80	2.4050	S.20 0 14.6	4.375	24	20 25 37.79	2.3146	S.14 18 15.8	9.582

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 9.					THURSDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 25 37.79	2.3146	S. 14 18 15.8	9.582	0	22 14 26.20	2.2308	S. 5 16 46.8	12.540
1	20 27 56.60	2.3123	14 8 38.2	9.670	1	22 16 40.02	2.2299	5 4 13.4	12.573
2	20 30 15.27	2.3100	13 58 55.4	9.757	2	22 18 53.79	2.2291	4 51 38.0	12.605
3	20 32 33.80	2.3077	13 49 7.4	9.842	3	22 21 7.52	2.2284	4 39 0.8	12.635
4	20 34 52.20	2.3055	13 39 14.3	9.927	4	22 23 21.20	2.2277	4 26 21.8	12.664
5	20 37 10.46	2.3032	13 29 16.2	10.010	5	22 25 34.84	2.2271	4 13 41.1	12.692
6	20 39 28.58	2.3009	13 19 13.1	10.092	6	22 27 48.45	2.2265	4 0 58.8	12.718
7	20 41 46.56	2.2987	13 9 5.1	10.174	7	22 30 2.02	2.2259	3 48 14.9	12.744
8	20 44 4.42	2.2966	12 58 52.2	10.254	8	22 32 15.56	2.2254	3 35 29.5	12.768
9	20 46 22.15	2.2944	12 48 34.6	10.333	9	22 34 29.07	2.2250	3 22 42.7	12.791
10	20 48 39.75	2.2922	12 38 12.3	10.411	10	22 36 42.56	2.2246	3 9 54.6	12.812
11	20 50 57.21	2.2899	12 27 45.3	10.489	11	22 38 56.02	2.2242	2 57 5.2	12.832
12	20 53 14.54	2.2878	12 17 13.6	10.566	12	22 41 9.46	2.2239	2 44 14.7	12.851
13	20 55 31.74	2.2857	12 6 37.4	10.640	13	22 43 22.89	2.2237	2 31 23.1	12.869
14	20 57 48.82	2.2836	11 55 56.8	10.713	14	22 45 36.30	2.2234	2 18 30.4	12.887
15	21 0 5.77	2.2815	11 45 11.8	10.786	15	22 47 49.70	2.2232	2 5 36.7	12.902
16	21 2 22.60	2.2794	11 34 22.5	10.857	16	22 50 3.09	2.2232	1 52 42.2	12.915
17	21 4 39.30	2.2773	11 23 28.9	10.928	17	22 52 16.48	2.2232	1 39 46.9	12.927
18	21 6 55.88	2.2753	11 12 31.1	10.997	18	22 54 29.87	2.2232	1 26 50.9	12.939
19	21 9 12.34	2.2733	11 1 29.2	11.066	19	22 56 43.26	2.2232	1 13 54.2	12.949
20	21 11 28.68	2.2713	10 50 23.2	11.133	20	22 58 56.65	2.2232	1 0 57.0	12.957
21	21 13 44.90	2.2694	10 39 13.2	11.199	21	23 1 10.05	2.2234	0 47 59.3	12.965
22	21 16 1.01	2.2676	10 27 59.3	11.264	22	23 3 23.46	2.2236	0 35 1.2	12.972
23	21 18 17.01	2.2657	S. 10 16 41.5	11.328	23	23 5 36.88	2.2239	S. 0 22 2.7	12.976
	WEDNESDAY 10.					FRIDAY 12.			
0	21 20 32.89	2.2638	S. 10 5 19.9	11.391	0	23 7 50.32	2.2242	S. 0 9 4.0	12.979
1	21 22 48.66	2.2620	9 53 54.6	11.452	1	23 10 3.78	2.2245	N. 0 3 54.8	12.983
2	21 25 4.33	2.2602	9 42 25.6	11.512	2	23 12 17.26	2.2248	0 16 53.8	12.984
3	21 27 19.89	2.2585	9 30 53.1	11.571	3	23 14 30.76	2.2252	0 29 52.9	12.984
4	21 29 35.35	2.2568	9 19 17.1	11.629	4	23 16 44.29	2.2258	0 42 51.9	12.982
5	21 31 50.71	2.2551	9 7 37.6	11.687	5	23 18 57.86	2.2264	0 55 50.7	12.979
6	21 34 5.96	2.2534	8 55 54.7	11.743	6	23 21 11.46	2.2269	1 8 49.3	12.975
7	21 36 21.12	2.2518	8 44 8.5	11.797	7	23 23 25.09	2.2276	1 21 47.7	12.969
8	21 38 36.18	2.2502	8 32 19.1	11.850	8	23 25 38.77	2.2283	1 34 45.6	12.961
9	21 40 51.15	2.2487	8 20 26.5	11.902	9	23 27 52.49	2.2291	1 47 43.0	12.953
10	21 43 6.03	2.2472	8 8 30.8	11.953	10	23 30 6.26	2.2299	2 0 39.9	12.944
11	21 45 20.82	2.2457	7 56 32.1	12.003	11	23 32 20.08	2.2307	2 13 36.3	12.934
12	21 47 35.52	2.2443	7 44 30.5	12.051	12	23 34 33.94	2.2315	2 26 32.0	12.922
13	21 49 50.14	2.2430	7 32 26.0	12.098	13	23 36 47.86	2.2325	2 39 26.9	12.908
14	21 52 4.68	2.2417	7 20 18.7	12.145	14	23 39 1.84	2.2335	2 52 21.0	12.893
15	21 54 19.15	2.2405	7 8 8.6	12.190	15	23 41 15.88	2.2345	3 5 14.1	12.877
16	21 56 33.54	2.2392	6 55 55.9	12.233	16	23 43 29.98	2.2356	3 18 6.2	12.859
17	21 58 47.85	2.2379	6 43 40.6	12.276	17	23 45 44.15	2.2367	3 30 57.2	12.841
18	22 1 2.09	2.2367	6 31 22.7	12.318	18	23 47 58.38	2.2379	3 43 47.1	12.821
19	22 3 16.26	2.2357	6 19 2.4	12.358	19	23 50 12.69	2.2391	3 56 35.7	12.799
20	22 5 30.37	2.2347	6 6 39.7	12.397	20	23 52 27.07	2.2403	4 9 23.0	12.777
21	22 7 44.42	2.2336	5 54 14.8	12.434	21	23 54 41.53	2.2416	4 22 8.9	12.753
22	22 9 58.40	2.2326	5 41 47.6	12.471	22	23 56 56.06	2.2429	4 34 53.4	12.727
23	22 12 12.33	2.2317	5 29 18.2	12.507	23	23 59 10.68	2.2443	4 47 36.2	12.699
24	22 14 26.20	2.2308	S. 5 16 46.8	12.540	24	0 1 25.38	2.2457	N. 5 0 17.3	12.671

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 1 25.38	2.2457	N. 5 0 17.3	12.671
1	0 3 40.17	2.2472	5 12 56.7	12.642
2	0 5 55.05	2.2487	5 25 34.4	12.612
3	0 8 10.01	2.2502	5 38 10.2	12.580
4	0 10 25.07	2.2518	5 50 44.0	12.547
5	0 12 40.23	2.2535	6 3 15.8	12.512
6	0 14 55.49	2.2552	6 15 45.4	12.475
7	0 17 10.85	2.2568	6 28 12.8	12.438
8	0 19 26.31	2.2585	6 40 38.0	12.400
9	0 21 41.87	2.2603	6 53 0.8	12.359
10	0 23 57.54	2.2621	7 5 21.1	12.317
11	0 26 13.32	2.2639	7 17 38.9	12.275
12	0 28 29.21	2.2658	7 29 54.1	12.231
13	0 30 45.22	2.2677	7 42 6.6	12.186
14	0 33 1.34	2.2696	7 54 16.4	12.139
15	0 35 17.57	2.2715	8 6 23.3	12.090
16	0 37 33.92	2.2736	8 18 27.2	12.041
17	0 39 50.40	2.2757	8 30 28.2	11.991
18	0 42 7.00	2.2777	8 42 26.1	11.938
19	0 44 23.72	2.2797	8 54 20.8	11.885
20	0 46 40.57	2.2818	9 6 12.3	11.830
21	0 48 57.54	2.2839	9 18 0.4	11.774
22	0 51 14.64	2.2861	9 29 45.1	11.717
23	0 53 31.87	2.2882	N. 9 41 26.4	11.658

SUNDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 55 49.23	2.2904	N. 9 53 4.1	11.598
1	0 58 6.72	2.2927	10 4 38.1	11.537
2	1 0 24.35	2.2949	10 16 8.5	11.475
3	1 2 42.11	2.2972	10 27 35.1	11.411
4	1 5 0.01	2.2994	10 38 57.8	11.346
5	1 7 18.04	2.3017	10 50 16.6	11.279
6	1 9 36.21	2.3040	11 1 31.3	11.211
7	1 11 54.52	2.3063	11 12 41.9	11.142
8	1 14 12.97	2.3086	11 23 48.4	11.073
9	1 16 31.55	2.3109	11 34 50.7	11.002
10	1 18 50.27	2.3133	11 45 48.6	10.928
11	1 21 9.14	2.3157	11 56 42.1	10.854
12	1 23 28.15	2.3180	12 7 31.1	10.778
13	1 25 47.30	2.3203	12 18 15.5	10.702
14	1 28 6.59	2.3227	12 28 55.4	10.626
15	1 30 26.02	2.3250	12 39 30.6	10.547
16	1 32 45.59	2.3274	12 50 1.0	10.466
17	1 35 5.31	2.3298	13 0 26.5	10.384
18	1 37 25.17	2.3322	13 10 47.1	10.302
19	1 39 45.17	2.3345	13 21 2.7	10.218
20	1 42 5.31	2.3368	13 31 13.3	10.134
21	1 44 25.59	2.3392	13 41 18.8	10.048
22	1 46 46.01	2.3415	13 51 19.1	9.961
23	1 49 6.57	2.3438	14 1 14.1	9.872
24	1 51 27.27	2.3462	N.14 11 3.7	9.782

MONDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 51 27.27	2.3462	N.14 11 3.7	9.782
1	1 53 48.11	2.3485	14 20 47.9	9.692
2	1 56 9.09	2.3507	14 30 26.7	9.601
3	1 58 30.20	2.3530	14 40 0.0	9.508
4	2 0 51.45	2.3553	14 49 27.7	9.414
5	2 3 12.84	2.3576	14 58 49.7	9.318
6	2 5 34.36	2.3598	15 8 5.9	9.222
7	2 7 56.01	2.3620	15 17 16.3	9.125
8	2 10 17.80	2.3642	15 26 20.9	9.027
9	2 12 39.72	2.3663	15 35 19.6	8.928
10	2 15 1.76	2.3684	15 44 12.3	8.828
11	2 17 23.93	2.3706	15 52 59.0	8.727
12	2 19 46.23	2.3727	16 1 39.5	8.624
13	2 22 8.65	2.3747	16 10 13.8	8.521
14	2 24 31.19	2.3767	16 18 42.0	8.417
15	2 26 53.85	2.3787	16 27 3.9	8.312
16	2 29 16.63	2.3807	16 35 19.5	8.206
17	2 31 39.53	2.3826	16 43 28.6	8.099
18	2 34 2.54	2.3844	16 51 31.3	7.991
19	2 36 25.66	2.3862	16 59 27.5	7.882
20	2 38 48.89	2.3880	17 7 17.1	7.772
21	2 41 12.22	2.3897	17 15 0.2	7.662
22	2 43 35.66	2.3915	17 22 36.6	7.550
23	2 45 59.20	2.3932	N.17 30 6.2	7.438

TUESDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	2 48 22.84	2.3948	N.17 37 29.1	7.325
1	2 50 46.57	2.3964	17 44 45.2	7.211
2	2 53 10.40	2.3979	17 51 54.4	7.097
3	2 55 34.32	2.3993	17 58 56.8	6.982
4	2 57 58.32	2.4007	18 5 52.2	6.865
5	3 0 22.41	2.4021	18 12 40.6	6.749
6	3 2 46.58	2.4034	18 19 22.1	6.632
7	3 5 10.82	2.4047	18 25 56.5	6.513
8	3 7 35.14	2.4059	18 32 23.7	6.394
9	3 9 59.53	2.4070	18 38 43.8	6.275
10	3 12 23.98	2.4081	18 44 56.7	6.155
11	3 14 48.50	2.4092	18 51 2.4	6.034
12	3 17 13.08	2.4101	18 57 0.8	5.912
13	3 19 37.71	2.4109	19 2 51.9	5.791
14	3 22 2.39	2.4118	19 8 35.7	5.669
15	3 24 27.13	2.4126	19 14 12.2	5.547
16	3 26 51.91	2.4133	19 19 41.3	5.423
17	3 29 16.73	2.4139	19 25 3.0	5.299
18	3 31 41.58	2.4144	19 30 17.2	5.175
19	3 34 6.46	2.4150	19 35 24.0	5.051
20	3 36 31.38	2.4155	19 40 23.3	4.925
21	3 38 56.32	2.4158	19 45 15.0	4.799
22	3 41 21.27	2.4160	19 49 59.2	4.673
23	3 43 46.24	2.4162	19 54 35.8	4.547
24	3 46 11.22	2.4164	N.19 59 4.9	4.421

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	3 46 11.22	2.4164	N.19 59 4.9	4.421
1	3 48 36.21	2.4165	20 3 26.4	4.294
2	3 51 1.20	2.4164	20 7 40.2	4.166
3	3 53 26.18	2.4163	20 11 46.3	4.038
4	3 55 51.16	2.4162	20 15 44.8	3.911
5	3 58 16.12	2.4159	20 19 35.7	3.784
6	4 0 41.07	2.4156	20 23 18.9	3.656
7	4 3 6.00	2.4152	20 26 54.4	3.527
8	4 5 30.90	2.4147	20 30 22.2	3.399
9	4 7 55.77	2.4142	20 33 42.3	3.271
10	4 10 20.60	2.4136	20 36 54.7	3.142
11	4 12 45.40	2.4130	20 39 59.3	3.013
12	4 15 10.16	2.4122	20 42 56.2	2.884
13	4 17 34.87	2.4113	20 45 45.4	2.755
14	4 19 59.52	2.4103	20 48 26.8	2.626
15	4 22 24.11	2.4092	20 51 0.5	2.497
16	4 24 48.63	2.4082	20 53 26.5	2.369
17	4 27 13.09	2.4071	20 55 44.8	2.240
18	4 29 37.48	2.4058	20 57 55.3	2.111
19	4 32 1.79	2.4044	20 59 58.1	1.982
20	4 34 26.01	2.4030	21 1 53.2	1.854
21	4 36 50.15	2.4016	21 3 40.6	1.726
22	4 39 14.20	2.4000	21 5 20.3	1.597
23	4 41 38.15	2.3983	N.21 6 52.3	1.469

THURSDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	4 44 2.00	2.3966	N.21 8 16.6	1.341
1	4 46 25.74	2.3948	21 9 33.2	1.213
2	4 48 49.37	2.3929	21 10 42.2	1.086
3	4 51 12.89	2.3910	21 11 43.5	0.959
4	4 53 36.29	2.3889	21 12 37.2	0.832
5	4 55 59.56	2.3868	21 13 23.3	0.705
6	4 58 22.70	2.3846	21 14 1.8	0.578
7	5 0 45.71	2.3823	21 14 32.7	0.452
8	5 3 8.58	2.3800	21 14 56.1	0.327
9	5 5 31.31	2.3777	21 15 11.9	0.201
10	5 7 53.90	2.3752	21 15 20.2	+ 0.076
11	5 10 16.33	2.3726	21 15 21.0	− 0.049
12	5 12 38.61	2.3700	21 15 14.3	0.173
13	5 15 0.73	2.3673	21 15 0.2	0.297
14	5 17 22.68	2.3645	21 14 38.7	0.420
15	5 19 44.47	2.3617	21 14 9.8	0.543
16	5 22 6.09	2.3588	21 13 33.5	0.666
17	5 24 27.53	2.3557	21 12 49.9	0.788
18	5 26 48.78	2.3527	21 11 59.0	0.909
19	5 29 9.85	2.3497	21 11 0.8	1.030
20	5 31 30.74	2.3466	21 9 55.4	1.150
21	5 33 51.44	2.3433	21 8 42.8	1.270
22	5 36 11.94	2.3400	21 7 23.0	1.389
23	5 38 32.24	2.3367	21 5 56.1	1.508
24	5 40 52.35	2.3334	N.21 4 22.1	1.626

FRIDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 40 52.35	2.3334	N.21 4 22.1	1.626
1	5 43 12.25	2.3299	21 2 41.0	1.743
2	5 45 31.94	2.3263	21 0 52.9	1.861
3	5 47 51.41	2.3228	20 58 57.7	1.978
4	5 50 10.67	2.3192	20 56 55.6	2.093
5	5 52 29.71	2.3155	20 54 46.6	2.207
6	5 54 48.53	2.3117	20 52 30.8	2.321
7	5 57 7.12	2.3080	20 50 8.1	2.435
8	5 59 25.49	2.3042	20 47 38.6	2.548
9	6 1 43.63	2.3003	20 45 2.4	2.660
10	6 4 1.53	2.2964	20 42 19.4	2.772
11	6 6 19.20	2.2925	20 39 29.8	2.883
12	6 8 36.63	2.2885	20 36 33.6	2.992
13	6 10 53.82	2.2844	20 33 30.8	3.101
14	6 13 10.76	2.2803	20 30 21.5	3.210
15	6 15 27.46	2.2762	20 27 5.6	3.318
16	6 17 43.91	2.2721	20 23 43.3	3.425
17	6 20 0.11	2.2678	20 20 14.6	3.531
18	6 22 16.05	2.2635	20 16 39.6	3.636
19	6 24 31.74	2.2593	20 12 58.3	3.741
20	6 26 47.17	2.2551	20 9 10.7	3.845
21	6 29 2.35	2.2508	20 5 16.9	3.948
22	6 31 17.27	2.2464	20 1 16.9	4.051
23	6 33 31.92	2.2420	N.19 57 10.8	4.152

SATURDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 35 46.31	2.2376	N.19 52 58.7	4.252
1	6 38 0.43	2.2332	19 48 40.6	4.352
2	6 40 14.29	2.2287	19 44 16.5	4.452
3	6 42 27.88	2.2242	19 39 46.4	4.550
4	6 44 41.20	2.2197	19 35 10.5	4.647
5	6 46 54.25	2.2153	19 30 28.8	4.743
6	6 49 7.04	2.2108	19 25 41.3	4.839
7	6 51 19.55	2.2062	19 20 48.1	4.933
8	6 53 31.79	2.2017	19 15 49.3	5.027
9	6 55 43.75	2.1971	19 10 44.8	5.121
10	6 57 55.44	2.1925	19 5 34.7	5.213
11	7 0 6.85	2.1879	19 0 19.2	5.304
12	7 2 17.99	2.1833	18 54 58.2	5.395
13	7 4 28.85	2.1787	18 49 31.8	5.484
14	7 6 39.43	2.1741	18 44 0.1	5.573
15	7 8 49.74	2.1695	18 38 23.0	5.661
16	7 10 59.77	2.1648	18 32 40.7	5.748
17	7 13 9.52	2.1602	18 26 53.2	5.835
18	7 15 19.00	2.1556	18 21 0.5	5.921
19	7 17 28.20	2.1510	18 15 2.7	6.005
20	7 19 37.12	2.1465	18 8 59.9	6.088
21	7 21 45.76	2.1418	18 2 52.1	6.171
22	7 23 54.13	2.1372	17 56 39.3	6.253
23	7 26 2.22	2.1325	17 50 21.7	6.333
24	7 28 10.03	2.1279	N.17 43 59.3	6.413

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 28 10.03	2.1279	N.17 43 59.3	6.413
1	7 30 17.57	2.1233	17 37 32.1	6.493
2	7 32 24.83	2.1188	17 31 0.1	6.572
3	7 34 31.82	2.1143	17 24 23.4	6.650
4	7 36 38.54	2.1097	17 17 42.1	6.727
5	7 38 44.98	2.1050	17 10 56.2	6.803
6	7 40 51.14	2.1004	17 4 5.8	6.878
7	7 42 57.03	2.0960	16 57 10.9	6.952
8	7 45 2.66	2.0916	16 50 11.6	7.025
9	7 47 8.02	2.0871	16 43 7.9	7.097
10	7 49 13.11	2.0826	16 35 59.9	7.169
11	7 51 17.93	2.0781	16 28 47.6	7.241
12	7 53 22.48	2.0737	16 21 31.0	7.312
13	7 55 26.77	2.0692	16 14 10.2	7.380
14	7 57 30.79	2.0648	16 6 45.4	7.448
15	7 59 34.55	2.0605	15 59 16.5	7.515
16	8 1 38.05	2.0562	15 51 43.6	7.582
17	8 3 41.29	2.0519	15 44 6.7	7.648
18	8 5 44.28	2.0476	15 36 25.8	7.714
19	8 7 47.01	2.0434	15 28 41.0	7.777
20	8 9 49.49	2.0392	15 20 52.5	7.840
21	8 11 51.71	2.0349	15 13 0.2	7.903
22	8 13 53.68	2.0307	15 5 4.1	7.966
23	8 15 55.40	2.0266	N.14 57 4.3	8.027

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 17 56.87	2.0225	N.14 49 0.9	8.087
1	8 19 58.10	2.0184	14 40 53.9	8.146
2	8 21 59.08	2.0143	14 32 43.4	8.205
3	8 23 59.82	2.0103	14 24 29.3	8.263
4	8 26 0.32	2.0064	14 16 11.8	8.320
5	8 28 0.59	2.0025	14 7 50.9	8.376
6	8 30 0.62	1.9985	13 59 26.7	8.432
7	8 32 0.41	1.9947	13 50 59.1	8.487
8	8 33 59.98	1.9909	13 42 28.2	8.541
9	8 35 59.32	1.9871	13 33 54.2	8.594
10	8 37 58.43	1.9833	13 25 17.0	8.647
11	8 39 57.32	1.9796	13 16 36.6	8.699
12	8 41 55.98	1.9759	13 7 53.1	8.750
13	8 43 54.43	1.9723	12 59 6.6	8.800
14	8 45 52.66	1.9687	12 50 17.1	8.850
15	8 47 50.67	1.9651	12 41 24.6	8.899
16	8 49 48.47	1.9616	12 32 29.2	8.947
17	8 51 46.06	1.9582	12 23 31.0	8.994
18	8 53 43.45	1.9547	12 14 29.9	9.041
19	8 55 40.63	1.9513	12 5 26.1	9.087
20	8 57 37.61	1.9481	11 56 19.5	9.133
21	8 59 34.40	1.9448	11 47 10.2	9.178
22	9 1 30.99	1.9416	11 37 58.2	9.221
23	9 3 27.39	1.9384	11 28 43 6	9.264
24	9 5 23.59	1.9352	N.11 19 26.5	9.307

TUESDAY 23

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	9 5 23.59	1.9352	N.11 19 26.5	9.307
1	9 7 19.61	1.9321	11 10 6.8	9.348
2	9 9 15.44	1.9290	11 0 44.7	9.389
3	9 11 11.09	1.9260	10 51 20.1	9.430
4	9 13 6.56	1.9230	10 41 53.1	9.470
5	9 15 1.85	1.9201	10 32 23.7	9.510
6	9 16 56.97	1.9172	10 22 51.9	9.548
7	9 18 51.92	1.9144	10 13 17.9	9.586
8	9 20 46.70	1.9117	10 3 41.6	9.623
9	9 22 41.32	1.9090	9 54 3.1	9.660
10	9 24 35.78	1.9063	9 44 22.4	9.696
11	9 26 30.08	1.9037	9 34 39.6	9.731
12	9 28 24.22	1.9011	9 24 54.7	9.766
13	9 30 18.21	1.8986	9 15 7.7	9.800
14	9 32 12.05	1.8961	9 5 18.7	9.832
15	9 34 5.74	1.8937	8 55 27.8	9.865
16	9 35 59.29	1.8914	8 45 34.9	9.897
17	9 37 52.70	1.8891	8 35 40.1	9.929
18	9 39 45.98	1.8868	8 25 43.4	9.960
19	9 41 39.12	1.8846	8 15 44.9	9.990
20	9 43 32.13	1.8824	8 5 44.6	10.020
21	9 45 25.01	1.8803	7 55 42.5	10.049
22	9 47 17.77	1.8783	7 45 38.7	10.077
23	9 49 10.41	1.8763	N. 7 35 33.2	10.105

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 51 2.93	1.8744	N. 7 25 26.1	10.132
1	9 52 55.34	1.8726	7 15 17.3	10.159
2	9 54 47.64	1.8707	7 5 7.0	10.185
3	9 56 39.82	1.8689	6 54 55.1	10.211
4	9 58 31.90	1.8672	6 44 41.7	10.236
5	10 0 23.88	1.8656	6 34 26.8	10.260
6	10 2 15.77	1.8640	6 24 10.5	10.283
7	10 4 7.56	1.8624	6 13 52.8	10.306
8	10 5 59.26	1.8609	6 3 33.7	10.329
9	10 7 50.87	1.8595	5 53 13.3	10.351
10	10 9 42.40	1.8581	5 42 51.6	10.372
11	10 11 33.85	1.8567	5 32 28.6	10.393
12	10 13 25.21	1.8554	5 22 4.4	10.413
13	10 15 16.50	1.8543	5 11 39.0	10.433
14	10 17 7.72	1.8532	5 1 12.4	10.452
15	10 18 58.88	1.8521	4 50 44.7	10.471
16	10 20 49.97	1.8510	4 40 15.9	10.488
17	10 22 41.00	1.8500	4 29 46.1	10.506
18	10 24 31.97	1.8490	4 19 15.2	10.523
19	10 26 22.88	1.8482	4 8 43.3	10.539
20	10 28 13.75	1.8474	3 58 10.5	10.555
21	10 30 4.57	1.8466	3 47 36.7	10.571
22	10 31 55.34	1.8459	3 37 2.0	10.585
23	10 33 46.08	1.8453	3 26 26.5	10.598
24	10 35 36.78	1.8447	N. 3 15 50.2	10.612

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 35 36.78	1.8447	N. 3 15 50.2	10.612
1	10 37 27.44	1.8442	3 5 13.1	10.625
2	10 39 18.08	1.8437	2 54 35.2	10.637
3	10 41 8.69	1.8432	2 43 56.6	10.649
4	10 42 59.27	1.8429	2 33 17.3	10.661
5	10 44 49.84	1.8426	2 22 37.3	10.672
6	10 46 40.39	1.8423	2 11 56.7	10.681
7	10 48 30.92	1.8422	2 1 15.6	10.690
8	10 50 21.45	1.8421	1 50 33.9	10.700
9	10 52 11.97	1.8420	1 39 51.6	10.709
10	10 54 2.49	1.8420	1 29 8.8	10.717
11	10 55 53.01	1.8421	1 18 25.6	10.723
12	10 57 43.54	1.8422	1 7 42.0	10.730
13	10 59 34.07	1.8424	0 56 58.0	10.737
14	11 1 24.62	1.8426	0 46 13.6	10.742
15	11 3 15.18	1.8428	0 35 28.9	10.747
16	11 5 5.76	1.8432	0 24 43.9	10.752
17	11 6 56.37	1.8437	0 13 58.7	10.755
18	11 8 47.00	1.8441	N. 0 3 13.3	10.758
19	11 10 37.66	1.8446	S. 0 7 32.3	10.761
20	11 12 28.35	1.8452	0 18 18.1	10.764
21	11 14 19.08	1.8458	0 29 4.0	10.766
22	11 16 9.85	1.8465	0 39 50.0	10.767
23	11 18 0.66	1.8472	S. 0 50 36.0	10.768

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 19 51.51	1.8479	S. 1 1 22.1	10.769
1	11 21 42.41	1.8488	1 12 8.1	10.767
2	11 23 33.37	1.8498	1 22 54.1	10.766
3	11 25 24.39	1.8508	1 33 40.0	10.764
4	11 27 15.47	1.8518	1 44 25.8	10.762
5	11 29 6.61	1.8529	1 55 11.4	10.758
6	11 30 57.82	1.8541	2 5 56.8	10.755
7	11 32 49.10	1.8553	2 16 42.0	10.751
8	11 34 40.46	1.8566	2 27 26.9	10.747
9	11 36 31.89	1.8578	2 38 11.6	10.742
10	11 38 23.40	1.8592	2 48 55.9	10.735
11	11 40 15.00	1.8607	2 59 39.8	10.728
12	11 42 6.69	1.8622	3 10 23.3	10.721
13	11 43 58.47	1.8637	3 21 6.3	10.713
14	11 45 50.34	1.8653	3 31 48.9	10.706
15	11 47 42.31	1.8670	3 42 31.0	10.697
16	11 49 34.38	1.8688	3 53 12.5	10.687
17	11 51 26.56	1.8706	4 3 53.4	10.677
18	11 53 18.85	1.8724	4 14 33.7	10.666
19	11 55 11.25	1.8743	4 25 13.3	10.654
20	11 57 3.77	1.8762	4 35 52.2	10.642
21	11 58 56.40	1.8782	4 46 30.3	10.629
22	12 0 49.16	1.8803	4 57 7.7	10.616
23	12 2 42.04	1.8824	5 7 44.2	10.602
24	12 4 35.05	1.8846	S. 5 18 19.9	10.587

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 4 35.05	1.8846	S. 5 18 19.9	10.587
1	12 6 28.19	1.8869	5 28 54.7	10.572
2	12 8 21.47	1.8892	5 39 28.5	10.556
3	12 10 14.89	1.8915	5 50 1.4	10.539
4	12 12 8.45	1.8939	6 0 33.2	10.522
5	12 14 2.16	1.8964	6 11 4.0	10.504
6	12 15 56.02	1.8989	6 21 33.7	10.486
7	12 17 50.03	1.9015	6 32 2.3	10.466
8	12 19 44.20	1.9041	6 42 29.6	10.445
9	12 21 38.52	1.9067	6 52 55.7	10.424
10	12 23 33.00	1.9094	7 3 20.5	10.403
11	12 25 27.65	1.9122	7 13 44.0	10.381
12	12 27 22.47	1.9151	7 24 6.2	10.358
13	12 29 17.46	1.9180	7 34 27.0	10.334
14	12 31 12.63	1.9209	7 44 46.3	10.309
15	12 33 7.97	1.9238	7 55 4.1	10.284
16	12 35 3.49	1.9269	8 5 20.4	10.258
17	12 36 59.20	1.9300	8 15 35.1	10.232
18	12 38 55.09	1.9331	8 25 48.3	10.206
19	12 40 51.17	1.9363	8 35 59.8	10.177
20	12 42 47.45	1.9396	8 46 9.5	10.148
21	12 44 43.93	1.9430	8 56 17.5	10.118
22	12 46 40.61	1.9463	9 6 23.7	10.088
23	12 48 37.49	1.9497	S. 9 16 28.1	10.057

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 50 34.57	1.9531	S. 9 26 30.6	10.026
1	12 52 31.86	1.9566	9 36 31.2	9.993
2	12 54 29.36	1.9601	9 46 29.8	9.959
3	12 56 27.08	1.9637	9 56 26.3	9.925
4	12 58 25.01	1.9674	10 6 20.8	9.890
5	13 0 23.16	1.9711	10 16 13.1	9.853
6	13 2 21.54	1.9748	10 26 3.2	9.817
7	13 4 20.14	1.9786	10 35 51.1	9.780
8	13 6 18.97	1.9824	10 45 36.8	9.742
9	13 8 18.03	1.9863	10 55 20.2	9.703
10	13 10 17.33	1.9902	11 5 1.2	9.663
11	13 12 16.86	1.9942	11 14 39.7	9.622
12	13 14 16.63	1.9982	11 24 15.8	9.581
13	13 16 16.64	2.0022	11 33 49.4	9.538
14	13 18 16.90	2.0063	11 43 20.4	9.494
15	13 20 17.40	2.0104	11 52 48.7	9.449
16	13 22 18.15	2.0146	12 2 14.3	9.405
17	13 24 19.15	2.0188	12 11 37.3	9.360
18	13 26 20.40	2.0230	12 20 57.5	9.312
19	13 28 21.91	2.0273	12 30 14.8	9.264
20	13 30 23.68	2.0317	12 39 29.2	9.216
21	13 32 25.71	2.0360	12 48 40.7	9.167
22	13 34 28.00	2.0404	12 57 49.2	9.116
23	13 36 30.56	2.0448	13 6 54.6	9.064
24	13 38 33.38	2.0492	S. 13 15 56.9	9.012

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 38 33.38	2.0492	S. 13 15 56.9	9.012
1	13 40 36.47	2.0537	13 24 56.0	8.959
2	13 42 39.83	2.0583	13 33 52.0	8.906
3	13 44 43.47	2.0629	13 42 44.7	8.850
4	13 46 47.38	2.0675	13 51 34.0	8.794
5	13 48 51.57	2.0721	14 0 19.9	8.737
6	13 50 56.03	2.0767	14 9 2.4	8.679
7	13 53 0.77	2.0814	14 17 41.4	8.620
8	13 55 5.80	2.0861	14 26 16.8	8.560
9	13 57 11.11	2.0908	14 34 48.6	8.499
10	13 59 16.70	2.0956	14 43 16.7	8.437
11	14 1 22.58	2.1004	14 51 41.1	8.375
12	14 3 28.75	2.1052	15 0 1.7	8.311
13	14 5 35.21	2.1101	15 8 18.4	8.246
14	14 7 41.96	2.1149	15 16 31.2	8.181
15	14 9 49.00	2.1198	15 24 40.1	8.115
16	14 11 56.33	2.1247	15 32 45.0	8.047
17	14 14 3.96	2.1296	15 40 45.7	7.978
18	14 16 11.88	2.1345	15 48 42.3	7.908
19	14 18 20.10	2.1394	15 56 34.7	7.837
20	14 20 28.61	2.1443	16 4 22.8	7.766
21	14 22 37.42	2.1493	16 12 6.6	7.693
22	14 24 46.53	2.1543	16 19 46.0	7.619
23	14 26 55.94	2.1593	S. 16 27 20.9	7.544

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 29 5.65	2.1643	S. 16 34 51.3	7.469
1	14 31 15.66	2.1693	16 42 17.2	7.392
2	14 33 25.97	2.1743	16 49 38.4	7.314
3	14 35 36.58	2.1793	16 56 54.9	7.236
4	14 37 47.49	2.1843	17 4 6.7	7.157
5	14 39 58.70	2.1893	17 11 13.7	7.075
6	14 42 10.21	2.1944	17 18 15.7	6.993
7	14 44 22.03	2.1995	17 25 12.8	6.911
8	14 46 34.15	2.2045	17 32 5.0	6.828
9	14 48 46.57	2.2095	17 38 52.1	6.743
10	14 50 59.29	2.2145	17 45 34.1	6.657
11	14 53 12.31	2.2195	17 52 10.9	6.570
12	14 55 25.63	2.2245	17 58 42.5	6.482
13	14 57 39.25	2.2295	18 5 8.7	6.393
14	14 59 53.17	2.2344	18 11 29.6	6.303
15	15 2 7.38	2.2393	18 17 45.1	6.212
16	15 4 21.89	2.2443	18 23 55.1	6.121
17	15 6 36.70	2.2493	18 29 59.6	6.027
18	15 8 51.81	2.2542	18 35 58.4	5.933
19	15 11 7.21	2.2591	18 41 51.6	5.839
20	15 13 22.90	2.2640	18 47 39.1	5.742
21	15 15 38.89	2.2689	18 53 20.7	5.645
22	15 17 55.17	2.2737	18 58 56.5	5.547
23	15 20 11.73	2.2784	19 4 26.4	5.449
24	15 22 28.58	2.2832	S. 19 9 50.4	5.350

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 22 28.58	2.2832	S. 19 9 50.4	5.350
1	15 24 45.72	2.2880	19 15 8.4	5.248
2	15 27 3.14	2.2927	19 20 20.2	5.146
3	15 29 20.84	2.2973	19 25 25.9	5.043
4	15 31 38.82	2.3020	19 30 25.4	4.940
5	15 33 57.08	2.3067	19 35 18.7	4.836
6	15 36 15.62	2.3113	19 40 5.7	4.730
7	15 38 34.43	2.3158	19 44 46.3	4.623
8	15 40 53.51	2.3202	19 49 20.5	4.516
9	15 43 12.85	2.3246	19 53 48.2	4.407
10	15 45 32.46	2.3291	19 58 9.4	4.298
11	15 47 52.34	2.3335	20 2 24.0	4.187
12	15 50 12.48	2.3378	20 6 31.9	4.076
13	15 52 32.88	2.3421	20 10 33.1	3.964
14	15 54 53.53	2.3463	20 14 27.6	3.852
15	15 57 14.43	2.3504	20 18 15.4	3.739
16	15 59 35.58	2.3545	20 21 56.3	3.624
17	16 1 56.97	2.3586	20 25 30.3	3.509
18	16 4 18.61	2.3626	20 28 57.4	3.393
19	16 6 40.48	2.3665	20 32 17.5	3.276
20	16 9 2.59	2.3704	20 35 30.5	3.159
21	16 11 24.93	2.3742	20 38 36.5	3.041
22	16 13 47.50	2.3780	20 41 35.4	2.922
23	16 16 10.29	2.3817	S. 20 44 27.1	2.801

THURSDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 18 33.30	2.3853	S. 20 47 11.5	2.679

PHASES OF THE MOON.

	d	h	m
○ Full Moon	2	20	31.0
☾ Last Quarter	10	0	35.3
● New Moon	16	19	33.1
☽ First Quarter . . .	24	12	40.8

	d	h
☾ Perigee.	12	14.4
☾ Apogee.	24	20.4

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Pollux	W.	88° 19′ 3″	2954	89° 50′ 14″	2943	91° 21′ 38″	2934	92° 53′ 14″	2924
	Mars	W.	83 15 16	3087	84 43 41	3078	86 12 18	3067	87 41 8	3056
	Regulus	W.	51 25 0	2911	52 57 5	2900	54 29 24	2888	56 1 58	2877
	Antares	E.	48 31 6	2910	46 59 0	2902	45 26 44	2894	43 54 17	2887
	α Aquilæ	E.	100 55 14	3308	99 31 12	3294	98 6 54	3282	96 42 21	3269
2	Pollux	W.	100 34 17	2876	102 7 7	2867	103 40 8	2858	105 13 21	2849
	Mars	W.	95 8 32	3005	96 38 39	2993	98 9 0	2983	99 39 34	2973
	Regulus	W.	63 48 20	2822	65 22 19	2811	66 56 32	2800	68 31 0	2789
	Antares	E.	36 9 43	2852	34 36 22	2846	33 2 54	2842	31 29 20	2837
	α Aquilæ	E.	89 36 3	3213	88 10 9	3204	86 44 4	3195	85 17 49	3186
3	Regulus	W.	76 26 47	2737	78 2 38	2727	79 38 42	2716	81 15 0	2706
	Spica	W.	22 25 15	2720	24 1 28	2709	25 37 56	2698	27 14 38	2688
	α Aquilæ	E.	78 4 15	3154	76 37 11	3150	75 10 2	3147	73 42 49	3145
4	Regulus	W.	89 19 50	2657	90 57 27	2649	92 35 16	2639	94 13 18	2630
	Spica	W.	35 21 32	2638	36 59 35	2629	38 37 50	2620	40 16 18	2610
	α Aquilæ	E.	66 26 27	3148	64 59 16	3153	63 32 11	3159	62 5 13	3166
	Fomalhaut	E.	94 17 26	3116	92 49 36	3105	91 21 32	3095	89 53 16	3086
5	Regulus	W.	102 26 29	2587	104 5 42	2579	105 45 6	2570	107 24 42	2563
	Spica	W.	48 31 48	2565	50 11 31	2557	51 51 25	2548	53 31 31	2540
	α Aquilæ	E.	54 53 20	3234	53 27 51	3255	52 2 47	3279	50 38 11	3307
	Fomalhaut	E.	82 29 30	3052	81 0 22	3049	79 31 10	3046	78 1 54	3043
	α Pegasi	E.	100 12 43	2709	98 36 15	2699	96 59 34	2689	95 22 40	2681
6	Spica	W.	61 54 53	2499	63 36 7	2492	65 17 31	2485	66 59 6	2477
	Antares	W.	17 13 14	2702	18 49 51	2663	20 27 21	2629	22 5 36	2602
	α Aquilæ	E.	43 44 52	3516	42 24 46	3576	41 5 46	3647	39 48 2	3726
	Fomalhaut	E.	70 35 20	3050	69 6 9	3055	67 37 4	3061	66 8 7	3069
	α Pegasi	E.	87 15 16	2640	85 37 16	2633	83 59 6	2626	82 20 47	2620
	Sun	E.	141 46 25	2824	140 12 28	2815	138 38 19	2807	137 4 0	2798
7	Spica	W.	75 29 36	2441	77 12 12	2434	78 54 58	2427	80 37 54	2421
	Antares	W.	30 24 39	2510	32 5 38	2497	33 46 56	2485	35 28 31	2474
	Fomalhaut	E.	58 46 29	3137	57 19 4	3158	55 52 4	3181	54 25 32	3207
	α Pegasi	E.	74 7 12	2594	72 28 9	2591	70 49 1	2587	69 9 48	2583
	Sun	E.	129 9 46	2760	127 34 25	2751	125 58 53	2744	124 23 11	2737
8	Spica	W.	89 14 52	2389	90 58 43	2383	92 42 43	2376	94 26 52	2370
	Antares	W.	44 0 6	2425	45 43 5	2417	47 26 15	2409	49 9 37	2401
	Fomalhaut	E.	47 22 11	3402	45 59 57	3457	44 38 45	3520	43 18 43	3592
	α Pegasi	E.	60 52 54	2577	59 13 28	2578	57 34 3	2580	55 54 40	2583
	Sun	E.	116 22 22	2701	114 45 44	2695	113 8 57	2688	111 32 1	2682
9	Antares	W.	57 49 6	2366	59 33 29	2359	61 18 2	2353	63 2 44	2347
	α Pegasi	E.	47 39 9	2613	46 0 32	2624	44 22 10	2638	42 44 6	2653
	Sun	E.	103 25 15	2651	101 47 29	2644	100 9 34	2638	98 31 31	2633
10	Antares	W.	71 48 21	2320	73 33 52	2314	75 19 31	2309	77 5 17	2305
	α Aquilæ	W.	30 12 18	4702	31 13 16	4454	32 17 49	4241	33 25 36	4056
	α Arietis	E.	75 59 34	2342	74 14 36	2339	72 29 33	2335	70 44 24	2331

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff	XVIIIh.	P. L. of Diff.	XXIh.	P. L of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Pollux	W.	94 25 2	2915	95 57 2	2905	97 29 15	2895	99 1 40	2886
	MARS	W.	89 10 11	3046	90 39 27	3035	92 8 56	3025	93 38 38	3015
	Regulus	W.	57 34 46	2866	59 7 48	2855	60 41 4	2844	62 14 35	2833
	Antares	E.	42 21 41	2879	40 48 55	2872	39 16 0	2865	37 42 56	2858
	α Aquilæ	E.	95 17 33	3256	93 52 30	3245	92 27 14	3234	91 1 45	3223
2	Pollux	W.	106 46 45	2841	108 20 20	2831	109 54 7	2823	111 28 5	2815
	MARS	W.	101 10 20	2963	102 41 19	2953	104 12 31	2942	105 43 56	2933
	Regulus	W.	70 5 42	2779	71 40 38	2769	73 15 47	2758	74 51 10	2747
	Antares	E.	29 55 40	2834	28 21 56	2833	26 48 11	2833	25 14 26	2836
	α Aquilæ	E.	83 51 23	3178	82 24 48	3171	80 58 4	3165	79 31 13	3159
3	Regulus	W.	82 51 32	2696	84 28 17	2687	86 5 15	2677	87 42 26	2667
	Spica	W.	28 51 34	2678	30 28 43	2668	32 6 6	2658	33 43 42	2648
	α Aquilæ	E.	72 15 34	3143	70 48 17	3143	69 20 59	3143	67 53 42	3145
4	Regulus	W.	95 51 32	2621	97 29 59	2612	99 8 38	2604	100 47 28	2596
	Spica	W.	41 54 59	2601	43 33 53	2592	45 12 59	2583	46 52 17	2574
	α Aquilæ	E	60 38 23	3175	59 11 44	3187	57 45 19	3200	56 19 10	3216
	Fomalhaut	E.	88 24 49	3078	86 56 12	3070	85 27 26	3064	83 58 32	3057
5	Regulus	W.	109 4 28	2565	110 44 25	2548	112 24 32	2540	114 4 49	2533
	Spica	W.	55 11 49	2532	56 52 18	2524	58 32 58	2515	60 13 50	2507
	α Aquilæ	E.	49 14 8	3338	47 50 41	3375	46 27 56	3416	45 5 58	3463
	Fomalhaut	E.	76 32 35	3043	75 3 15	3043	73 33 55	3043	72 4 36	3046
	α Pegasi	E.	93 45 34	2672	92 8 16	2663	90 30 47	2655	88 53 7	2647
6	Spica	W.	68 40 51	2470	70 22 46	2462	72 4 52	2455	73 47 9	2448
	Antares	W.	23 44 28	2579	25 23 52	2559	27 3 44	2541	28 44 0	2525
	α Aquilæ	E.	38 31 42	3817	37 16 57	3920	36 3 58	4040	34 52 58	4179
	Fomalhaut	E.	64 39 19	3078	63 10 42	3090	61 42 20	3104	60 14 15	3119
	α Pegasi	E.	80 42 19	2614	79 3 43	2609	77 25 0	2603	75 46 9	2599
	SUN	E.	135 29 30	2790	133 54 49	2782	132 19 58	2775	130 44 57	2767
7	Spica	W.	82 20 59	2415	84 4 13	2408	85 47 37	2401	87 31 10	2395
	Antares	W.	37 10 21	2462	38 52 27	2453	40 34 47	2443	42 17 20	2434
	Fomalhaut	E.	52 59 31	3237	51 34 6	3271	50 9 21	3310	48 45 21	3353
	α Pegasi	E.	67 30 30	2581	65 51 9	2579	64 11 45	2578	62 32 20	2577
	SUN	E.	122 47 20	2730	121 11 20	2722	119 35 10	2716	117 58 51	2708
8	Spica	W.	96 11 10	2364	97 55 36	2359	99 40 10	2353	101 24 53	2347
	Antares	W.	50 53 10	2394	52 36 54	2387	54 20 48	2380	56 4 52	2373
	Fomalhaut	E.	42 0 0	3673	40 42 44	3764	39 27 4	3868	38 13 12	3987
	α Pegasi	E.	54 15 21	2586	52 36 7	2591	50 56 59	2596	49 17 59	2604
	SUN	E.	109 54 57	2675	108 17 44	2669	106 40 23	2663	105 2 53	2657
9	Antares	W.	64 47 35	2342	66 32 34	2335	68 17 42	2330	70 2 58	2325
	α Pegasi	E.	41 6 23	2672	39 29 5	2694	37 52 17	2721	36 16 5	2753
	SUN	E.	96 53 21	2627	95 15 3	2621	93 36 37	2616	91 58 4	2611
10	Antares	W.	78 51 9	2300	80 37 8	2296	82 23 14	2291	84 9 26	2287
	α Aquilæ	W.	34 36 20	3897	35 49 43	3757	37 5 30	3635	38 23 27	3526
	α Arietis	E.	68 59 10	2328	67 13 51	2325	65 28 28	2322	63 43 1	2320

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh	P. L. of Diff.	IXh.	P. L. of Diff.
10	Sun	E.	90° 19′ 24″	2606	88° 40′ 37″	2600	87° 1′ 42″	2596	85° 22′ 41″	2591
11	Antares	W.	85 55 44	2284	87 42 7	2280	89 28 36	2277	91 15 10	2274
	α Aquilæ	W.	39 43 22	3431	41 5 4	3346	42 28 22	3270	43 53 8	3204
	α Arietis	E.	61 57 31	2318	60 11 58	2316	58 26 22	2315	56 40 44	2314
	Sun	E.	77 5 59	2569	75 26 21	2565	73 46 38	2561	72 6 49	2558
12	Antares	W.	100 9 2	2262	101 55 58	2260	103 42 56	2258	105 29 57	2257
	α Aquilæ	W.	51 14 31	2958	52 45 36	2923	54 17 26	2891	55 49 56	2862
	α Arietis	E.	47 52 33	2318	46 7 0	2321	44 21 31	2325	42 36 8	2329
	Sun	E.	63 46 42	2544	62 6 30	2542	60 26 15	2540	58 45 57	2538
13	α Aquilæ	W.	63 40 33	2758	65 15 56	2743	66 51 39	2731	68 27 38	2719
	Fomalhaut	W.	39 3 19	3672	40 20 36	3569	41 39 44	3478	43 0 33	3398
	Sun	E.	50 24 4	3535	48 43 40	3535	47 3 16	3537	45 22 54	2538
14	α Aquilæ	W.	76 30 35	2686	78 7 34	2684	79 44 36	2683	81 21 39	2683
	Fomalhaut	W.	50 4 30	3113	51 32 24	3074	53 1 5	3039	54 30 29	3009
	Sun	E.	37 1 35	2548	35 21 29	2552	33 41 28	2556	32 1 32	2560
18	Sun	W.	14 58 19	2854	16 31 37	2868	18 4 37	2883	19 37 18	2898
	Pollux	E.	39 57 49	2732	38 21 51	2760	36 46 31	2792	35 11 52	2826
	Mars	E.	53 5 53	2756	51 30 27	2772	49 55 22	2788	48 20 39	2806
	Regulus	E.	75 53 6	2554	74 13 8	2568	72 33 29	2583	70 54 10	2596
19	Sun	W.	27 15 53	2974	28 46 38	2990	30 17 3	3005	31 47 9	3021
	Pollux	E.	27 31 9	3057	26 2 7	3124	24 34 26	3199	23 8 16	3269
	Mars	E.	40 32 50	2898	39 0 28	2918	37 28 32	2939	35 57 2	2959
	Regulus	E.	62 42 33	2671	61 5 14	2687	59 28 16	2702	57 51 39	2717
20	Sun	W.	39 12 54	3097	40 41 7	3113	42 9 1	3128	43 36 37	3143
	Venus	W.	17 15 57	3247	18 41 11	3253	20 6 17	3263	21 31 12	3273
	Mars	E.	28 26 31	3081	26 57 58	3110	25 30 1	3142	24 2 42	3177
	Regulus	E.	49 53 43	2796	48 19 10	2811	46 44 57	2828	45 11 5	2844
	Spica	E.	103 38 5	2759	102 2 43	2772	100 27 39	2786	98 52 53	2800
21	Sun	W.	50 50 17	3213	52 16 11	3226	53 41 49	3239	55 7 12	3252
	Venus	W.	28 32 33	3332	29 56 8	3344	31 19 29	3356	32 42 36	3367
	Regulus	E.	37 26 59	2926	35 55 13	2943	34 23 49	2961	32 52 47	2978
	Spica	E.	91 3 24	2865	89 30 20	2877	87 57 32	2890	86 25 0	2901
22	Sun	W.	62 10 29	3310	63 34 29	3321	64 58 16	3332	66 21 51	3341
	Venus	W.	39 34 54	3423	40 56 44	3433	42 18 23	3444	43 39 50	3453
	Spica	E.	78 45 56	2955	77 14 47	2965	75 43 51	2974	74 13 6	2984
23	Sun	W.	73 17 8	3383	74 39 44	3391	76 2 11	3397	77 24 31	3403
	Venus	W.	50 24 36	3495	51 45 6	3502	53 5 28	3508	54 25 43	3514
	Pollux	W.	26 33 0	3422	27 54 52	3391	29 17 19	3365	30 40 16	3343
	Spica	E.	66 42 3	3022	65 12 18	3029	63 42 41	3035	62 13 12	3042
	Antares	E.	112 5 51	3043	110 36 31	3049	109 7 19	3055	107 38 14	3060
24	Sun	W.	84 14 39	3425	85 36 27	3429	86 58 11	3431	88 19 52	3433
	Venus	W.	61 5 30	3537	62 25 13	3540	63 44 53	3542	65 4 31	3545

GREENWICH MEAN TIME

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh	P. L. of Diff.
10	Sun	E.	83° 43′ 33″	2586	82° 4′ 19″	2581	80° 24′ 58″	2577	78° 45′ 31″	2573
11	Antares	W.	93 1 48	2271	94 48 30	2268	96 35 17	2265	98 22 8	2263
	α Aquilæ	W.	45 19 13	3143	46 46 30	3089	48 14 53	3041	49 44 15	2997
	α Arietis	E.	54 55 5	2314	53 9 26	2314	51 23 47	2315	49 38 9	2316
	Sun	E.	70 26 56	2555	68 46 59	2551	67 6 57	2548	65 26 51	2546
12	Antares	W.	107 17 0	2256	109 4 4	2256	110 51 8	2256	112 38 12	2256
	α Aquilæ	W.	57 23 3	2836	58 56 44	2813	60 30 55	2793	62 5 32	2774
	α Arietis	E.	40 50 51	2335	39 5 42	2342	37 20 44	2351	35 35 59	2362
	Sun	E.	57 5 37	2537	55 25 15	2536	53 44 52	2535	52 4 28	2535
13	α Aquilæ	W.	70 3 52	2710	71 40 19	2702	73 16 56	2695	74 53 42	2690
	Fomalhaut	W.	44 22 52	3326	45 46 33	3263	47 11 28	3207	48 37 29	3157
	Sun	E.	43 42 33	2539	42 2 14	2541	40 21 58	2543	38 41 45	2545
14	α Aquilæ	W.	82 58 42	2684	84 35 44	2686	86 12 43	2689	87 49 38	2694
	Fomalhaut	W.	56 0 30	2983	57 31 4	2959	59 2 8	2939	60 33 38	2921
	Sun	E.	30 21 42	2564	28 41 58	2569	27 2 21	2575	25 22 52	2582
18	Sun	W.	21 9 40	2913	22 41 42	2928	24 13 25	2943	25 44 49	2959
	Pollux	E.	33 37 58	2863	32 4 52	2904	30 32 38	2950	29 1 22	3000
	Mars	E.	46 46 19	2824	45 12 22	2842	43 38 48	2859	42 5 37	2878
	Regulus	E.	69 15 10	2611	67 36 30	2626	65 58 11	2641	64 20 12	2656
19	Sun	W.	33 16 56	3036	34 46 24	3052	36 15 33	3067	37 44 23	3082
	Pollux	E.	21 43 52	3396	20 21 31	3524	19 1 33	3681	17 44 26	3877
	Mars	E.	34 25 58	2981	32 55 22	3005	31 25 15	3028	29 55 37	3054
	Regulus	E.	56 15 22	2733	54 39 26	2749	53 3 51	2765	51 28 37	2780
20	Sun	W.	45 3 55	3158	46 30 56	3171	47 57 40	3185	49 24 7	3199
	Venus	W.	22 55 55	3284	24 20 25	3296	25 44 41	3307	27 8 44	3319
	Mars	E.	22 36 5	3215	21 10 14	3260	19 45 16	3312	18 21 18	3372
	Regulus	E.	43 37 34	2860	42 4 24	2876	40 31 35	2892	38 59 6	2909
	Spica	E.	97 18 25	2814	95 44 15	2827	94 10 22	2839	92 36 45	2852
21	Sun	W.	56 32 20	3265	57 57 13	3276	59 21 52	3288	60 46 17	3300
	Venus	W.	34 5 30	3379	35 28 10	3391	36 50 37	3401	38 12 52	3413
	Regulus	E.	31 22 7	2997	29 51 50	3017	28 21 58	3038	26 52 32	3060
	Spica	E.	84 52 43	2913	83 20 41	2924	81 48 53	2935	80 17 18	2945
22	Sun	W.	67 45 15	3351	69 8 28	3359	70 31 31	3368	71 54 24	3376
	Venus	W.	45 1 7	3462	46 22 14	3471	47 43 11	3480	49 3 58	3488
	Spica	E.	72 42 33	2993	71 12 11	3001	69 41 59	3008	68 11 56	3016
23	Sun	W.	78 46 44	3408	80 8 51	3414	81 30 52	3418	82 52 48	3423
	Venus	W.	55 45 52	3520	57 5 54	3525	58 25 51	3529	59 45 43	3534
	Pollux	W.	32 3 38	3324	33 27 22	3307	34 51 25	3293	36 15 45	3280
	Spica	E.	60 43 51	3047	59 14 36	3051	57 45 26	3055	56 16 21	3059
	Antares	E.	106 9 16	3065	104 40 24	3069	103 11 37	3073	101 42 55	3077
24	Sun	W.	89 41 31	3435	91 3 8	3435	92 24 45	3436	93 46 21	3436
	Venus	W.	66 24 6	3545	67 43 40	3546	69 3 13	3547	70 22 45	3547

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
24	Pollux	W.	37° 40′ 20″	3269	39° 5′ 8″	3259	40° 30′ 7″	3250	41° 55′ 17″	3241
	Mars	W.	19 56 13	3505	21 16 32	3480	22 37 19	3459	23 58 29	3441
	Spica	E.	54 47 21	3062	53 18 25	3065	51 49 32	3067	50 20 42	3069
	Antares	E.	100 14 17	3080	98 45 43	3082	97 17 12	3084	95 48 43	3087
25	Sun	W.	95 7 57	3435	96 29 34	3434	97 51 12	3431	99 12 53	3430
	Venus	W.	71 42 17	3546	73 1 50	3545	74 21 25	3543	75 41 2	3541
	Pollux	W.	49 3 30	3204	50 29 34	3198	51 55 46	3191	53 22 6	3184
	Mars	W.	30 48 27	3382	32 11 4	3373	33 33 51	3365	34 56 48	3356
	Spica	E.	42 56 56	3071	41 28 11	3070	39 59 25	3069	38 30 37	3067
	Antares	E.	88 26 41	3087	86 58 16	3087	85 29 50	3086	84 1 23	3084
26	Sun	W.	106 2 6	3410	107 24 11	3406	108 46 21	3400	110 8 38	3393
	Venus	W.	82 19 54	3522	83 39 54	3516	85 0 0	3510	86 20 13	3504
	Pollux	W.	60 35 50	3148	62 3 1	3141	63 30 21	3133	64 57 51	3125
	Mars	W.	41 53 52	3317	43 17 44	3308	44 41 46	3300	46 5 58	3291
	Regulus	W.	23 34 47	3178	25 1 22	3160	26 28 19	3143	27 55 36	3126
	Spica	E.	31 5 51	3050	29 36 40	3046	28 7 24	3041	26 38 2	3035
	Antares	E.	76 38 18	3067	75 9 28	3062	73 40 32	3056	72 11 29	3052
27	Sun	W.	117 2 3	3355	118 25 11	3346	119 48 29	3338	121 11 57	3327
	Venus	W.	93 3 11	3466	94 24 13	3457	95 45 25	3448	97 6 47	3438
	Pollux	W.	72 17 51	3081	73 46 24	3072	75 15 8	3062	76 44 4	3052
	Mars	W.	53 9 31	3245	54 34 47	3235	56 0 15	3225	57 25 55	3214
	Regulus	W.	35 16 28	3060	36 45 27	3047	38 14 42	3034	39 44 12	3022
	Antares	E.	64 44 28	3019	63 14 39	3011	61 44 40	3003	60 14 31	2995
28	Sun	W.	128 12 17	3274	129 36 59	3262	131 1 55	3250	132 27 5	3237
	Venus	W.	103 56 33	3385	105 19 7	3372	106 41 55	3361	108 4 56	3349
	Pollux	W.	84 11 56	2999	85 42 10	2988	87 12 38	2977	88 43 20	2965
	Mars	W.	64 37 28	3156	66 4 28	3146	67 31 42	3133	68 59 11	3121
	Regulus	W.	47 15 32	2961	48 46 34	2947	50 17 53	2935	51 49 28	2922
	Antares	E.	52 41 9	2951	51 9 55	2941	49 38 28	2931	48 6 49	2922
	α Aquilæ	E.	104 43 34	3365	103 20 38	3349	101 57 23	3333	100 33 50	3318
29	Pollux	W.	96 20 30	2906	97 52 41	2894	99 25 7	2883	100 57 48	2870
	Mars	W.	76 20 28	3056	77 49 32	3043	79 18 52	3029	80 48 29	3016
	Regulus	W.	59 31 29	2856	61 4 44	2842	62 38 17	2829	64 12 7	2816
	Antares	E.	40 25 29	2873	38 52 36	2864	37 19 31	2855	35 46 15	2846
	α Aquilæ	E.	93 31 39	3245	92 6 23	3231	90 40 51	3219	89 15 4	3205
30	Mars	W.	88 20 48	2946	89 52 8	2933	91 23 45	2919	92 55 40	2905
	Regulus	W.	72 5 42	2747	73 41 19	2734	75 17 14	2720	76 53 27	2706
	Spica	W.	18 3 7	2732	19 39 4	2717	21 15 21	2704	22 51 56	2689
	Antares	E.	27 57 21	2814	26 23 11	2812	24 48 59	2812	23 14 47	2815
	α Aquilæ	E.	82 2 33	3151	80 35 25	3141	79 8 5	3133	77 40 35	3125
	Fomalhaut	E.	109 42 44	3265	108 17 52	3242	106 52 33	3220	105 26 48	3199
31	Regulus	W.	84 59 5	2640	86 37 6	2626	88 15 25	2613	89 54 2	2601
	Spica	W.	30 59 33	2621	32 38 0	2607	34 16 45	2594	35 55 48	2582
	α Aquilæ	E.	70 21 2	3098	68 52 50	3096	67 24 36	3096	65 56 21	3096
	Fomalhaut	E.	98 12 0	3105	96 43 56	3088	95 15 32	3073	93 46 49	3059

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
24	Pollux	W.	43° 20′ 38″	3233	44° 46′ 8″	3225	46° 11′ 47″	3219	47° 37′ 34″	3211
	Mars	W.	25 19 59	3426	26 41 46	3414	28 3 47	3402	29 26 1	3392
	Spica	E.	48 51 55	3070	47 23 9	3071	45 54 24	3072	44 25 40	3072
	Antares	E.	94 20 17	3088	92 51 53	3088	91 23 29	3088	89 55 5	3088
25	Sun	W.	100 34 36	3427	101 56 22	3423	103 18 12	3419	104 40 7	3415
	Venus	W.	77 0 41	3538	78 20 23	3535	79 40 9	3531	80 59 59	3526
	Pollux	W.	54 48 34	3178	56 15 10	3170	57 41 55	3163	59 8 48	3156
	Mars	W.	36 19 55	3348	37 43 11	3341	39 6 35	3332	40 30 9	3325
	Spica	E.	37 1 47	3065	35 32 54	3061	34 3 57	3058	32 34 56	3055
	Antares	E.	82 32 54	3081	81 4 21	3078	79 35 44	3074	78 7 3	3071
26	Sun	W.	111 31 3	3386	112 53 35	3379	114 16 16	3372	115 39 5	3364
	Venus	W.	87 40 33	3497	89 1 0	3490	90 21 35	3483	91 42 18	3474
	Pollux	W.	66 25 30	3117	67 53 19	3108	69 21 19	3100	70 49 29	3090
	Mars	W.	47 30 20	3382	48 54 52	3374	50 19 34	3365	51 44 27	3355
	Regulus	W.	29 23 12	3113	30 51 6	3099	32 19 17	3086	33 47 44	3072
	Spica	E.	25 8 33	3030	23 38 57	3024	22 9 14	3018	20 39 23	3012
	Antares	E.	70 42 20	3046	69 13 4	3039	67 43 40	3033	66 14 8	3026
27	Sun	W.	122 35 37	3318	123 59 28	3306	125 23 32	3296	126 47 48	3285
	Venus	W.	98 28 21	3428	99 50 6	3417	101 12 3	3407	102 34 12	3396
	Pollux	W.	78 13 13	3042	79 42 34	3031	81 12 8	3021	82 41 55	3009
	Mars	W.	58 51 47	3204	60 17 52	3193	61 44 10	3181	63 10 42	3169
	Regulus	W.	41 13 57	3009	42 43 58	2997	44 14 14	2985	45 44 45	2973
	Antares	E.	58 44 12	2967	57 13 43	2978	55 43 3	2969	54 12 12	2960
28	Sun	W.	133 52 30	3225	135 18 9	3213	136 44 3	3199	138 10 13	3187
	Venus	W.	109 28 11	3336	110 51 41	3324	112 15 25	3311	113 39 24	3297
	Pollux	W.	90 14 17	2954	91 45 28	2942	93 16 54	2931	94 48 34	2918
	Mars	W.	70 26 55	3108	71 54 55	3096	73 23 10	3082	74 51 41	3069
	Regulus	W.	53 21 19	2909	54 53 26	2896	56 25 50	2883	57 58 31	2869
	Antares	E.	46 34 58	2912	45 2 54	2902	43 30 38	2893	41 58 10	2883
	α Aquilæ	E.	99 9 59	3302	97 45 50	3287	96 21 23	3272	94 56 39	3259
29	Pollux	W.	102 30 45	2859	104 3 57	2846	105 37 25	2835	107 11 8	2823
	Mars	W.	82 18 22	3002	83 48 32	2988	85 19 0	2974	86 49 45	2960
	Regulus	W.	65 46 14	2802	67 20 39	2788	68 55 22	2775	70 30 23	2761
	Antares	E.	34 12 47	2838	32 39 9	2831	31 5 21	2825	29 31 25	2818
	α Aquilæ	E.	87 49 1	3193	86 22 44	3182	84 56 13	3171	83 29 29	3161
30	Mars	W.	94 27 52	2891	96 0 22	2877	97 33 10	2864	99 6 15	2851
	Regulus	W.	78 29 59	2693	80 6 48	2679	81 43 56	2666	83 21 22	2653
	Spica	W.	24 28 50	2675	26 6 3	2662	27 43 34	2648	29 21 24	2634
	Antares	E.	21 40 38	2821	20 6 38	2834	18 32 54	2853	16 59 35	2883
	α Aquilæ	E.	76 12 56	3118	74 45 8	3111	73 17 12	3106	71 49 10	3101
	Fomalhaut	E.	104 0 38	3178	102 34 3	3158	101 7 4	3140	99 39 43	3122
31	Regulus	W.	91 32 56	2588	93 12 8	2576	94 51 36	2564	96 31 21	2552
	Spica	W.	37 35 8	2569	39 14 46	2556	40 54 41	2543	42 34 54	2532
	α Aquilæ	E.	64 28 6	3097	62 59 53	3101	61 31 45	3107	60 3 44	3114
	Fomalhaut	E.	92 17 49	3045	90 48 32	3032	89 18 59	3020	87 49 11	3008

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	4 37 0.09	10.230	N.22 4 56.5	+20.26	15 48.37	68.43	2 27.67	0.372
Frid.	2	4 41 5.80	10.246	22 12 51.1	19.29	15 48.24	68.48	2 18.55	0.388
Sat.	3	4 45 11.89	10.262	22 20 22.5	18.32	15 48.11	68.53	2 9.04	0.404
Sun.	4	4 49 18.35	10.277	22 27 30.5	+17.34	15 47.98	68.58	1 59.16	0.419
Mon.	5	4 53 25.18	10.291	22 34 14.9	16.35	15 47.86	68.63	1 48.91	0.433
Tues.	6	4 57 32.36	10.305	22 40 35.6	15.36	15 47.74	68.67	1 38.32	0.447
Wed.	7	5 1 39.86	10.319	22 46 32.6	+14.37	15 47.62	68.71	1 27.41	0.461
Thur.	8	5 5 47.67	10.332	22 52 5.6	13.37	15 47.50	68.75	1 16.19	0.474
Frid.	9	5 9 55.77	10.343	22 57 14.5	12.36	15 47.39	68.79	1 4.67	0.485
Sat.	10	5 14 4.15	10.354	23 1 59.2	+11.35	15 47.28	68.82	0 52.88	0.496
Sun.	11	5 18 12.78	10.364	23 6 19.5	10.33	15 47.18	68.85	0 40.85	0.506
Mon.	12	5 22 21.63	10.373	23 10 15.4	9.31	15 47.08	68.88	0 28.59	0.515
Tues.	13	5 26 30.67	10.380	23 13 46.9	+ 8.30	15 46.99	68.90	0 16.13	0.522
Wed.	14	5 30 39.88	10.386	23 16 53.8	7.27	15 46.91	68.92	0 3.51	0.528
Thur.	15	5 34 49.24	10.392	23 19 36.0	6.24	15 46.83	68.93	0 9.26	0.534
Frid.	16	5 38 58.73	10.396	23 21 53.5	+ 5.21	15 46.75	68.95	0 22.15	0.538
Sat.	17	5 43 8.31	10.400	23 23 46.4	4.18	15 46.68	68.96	0 35.14	0.542
Sun.	18	5 47 17.94	10.402	23 25 14.5	3.15	15 46.62	68.97	0 48.20	0.544
Mon.	19	5 51 27.63	10.403	23 26 17.8	+ 2.12	15 46.56	68.97	1 1.28	0.545
Tues.	20	5 55 37.32	10.402	23 26 56.3	1.09	15 46.51	68.98	1 14.37	0.544
Wed.	21	5 59 47.00	10.402	23 27 10.0	+ 0.05	15 46.46	68.98	1 27.44	0.544
Thur.	22	6 3 56.61	10.399	23 26 58.9	− 0.98	15 46.42	68.97	1 40.47	0.542
Frid.	23	6 8 6.17	10.396	23 26 23.0	2.01	15 46.38	68.96	1 53.44	0.538
Sat.	24	6 12 15.62	10.391	23 25 22.4	3.04	15 46.35	68.95	2 6.29	0.533
Sun.	25	6 16 24.96	10.385	23 23 57.1	− 4.07	15 46.32	68.94	2 19.04	0.527
Mon.	26	6 20 34.16	10.379	23 22 7.1	5.10	15 46.29	68.92	2 31.65	0.521
Tues.	27	6 24 43.20	10.372	23 19 52.5	6.12	15 46.27	68.90	2 44.10	0.515
Wed.	28	6 28 52.07	10.364	23 17 13.4	− 7.15	15 46.25	68.88	2 56.37	0.507
Thur.	29	6 33 0.73	10.355	23 14 9.8	8.17	15 46.23	68.85	3 8.45	0.498
Frid.	30	6 37 9.18	10.346	23 10 41 6	9.19	15 46.22	68.82	3 20.31	0.488
Sat.	31	6 41 17.39	10.336	N.23 6 49.0	−10.20	15 46.21	68.78	3 31.93	0.478

NOTE — The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	4 37 0.50	10.229	N. 22 4 57.3	+ 20.26	2 27.66	0.372	4 39 28.16
Frid.	2	4 41 6.18	10.245	22 12 51.9	19.29	2 18.54	0.388	4 43 24.72
Sat.	3	4 45 12.25	10.261	22 20 23.2	18.32	2 9.03	0.404	4 47 21.28
Sun.	4	4 49 18.69	10.276	22 27 31.1	+ 17.34	1 59.15	0.419	4 51 17.84
Mon.	5	4 53 25.49	10.290	22 34 15.4	16.35	1 48.90	0.433	4 55 14.39
Tues.	6	4 57 32.64	10.304	22 40 36.1	15.36	1 38.31	0.447	4 59 10.95
Wed.	7	5 1 40.11	10.318	22 46 33.0	+ 14.37	1 27.40	0.461	5 3 7.51
Thur.	8	5 5 47.89	10.331	22 52 5.9	13.37	1 16.18	0.474	5 7 4.07
Frid.	9	5 9 55.96	10.342	22 57 14.7	12.36	1 4.66	0.485	5 11 0.62
Sat.	10	5 14 4.31	10.353	23 1 59.3	+ 11.35	0 52.87	0.496	5 14 57.18
Sun.	11	5 18 12.90	10.363	23 6 19.6	10.33	0 40.84	0.506	5 18 53.74
Mon.	12	5 22 21.72	10.372	23 10 15.5	9.31	0 28.58	0.515	5 22 50.30
Tues.	13	5 26 30.72	10.379	23 13 46.9	+ 8.30	0 16.18	0.522	5 26 46.85
Wed.	14	5 30 39.89	10.385	23 16 53.8	7.27	0 3.52	0.528	5 30 43.41
Thur.	15	5 34 49.22	10.391	23 19 36.0	6.24	0 9.26	0.534	5 34 39.96
Frid.	16	5 38 58.67	10.395	23 21 53.5	+ 5.21	0 22.15	0.538	5 38 36.52
Sat.	17	5 43 8.21	10.399	23 23 46.4	4.18	0 35.13	0.542	5 42 33.08
Sun.	18	5 47 17.81	10.401	23 25 14.5	3.15	0 48.17	0.544	5 46 29.64
Mon.	19	5 51 27.46	10.402	23 26 17.8	+ 2.12	1 1.27	0.545	5 50 26.19
Tues.	20	5 55 37.11	10.401	23 26 56.3	1.09	1 14.36	0.544	5 54 22.75
Wed.	21	5 59 46.75	10.401	23 27 10.0	+ 0.05	1 27.43	0.544	5 58 19.31
Thur.	22	6 3 56.33	10.398	23 26 58.9	− 0.98	1 40.46	0.542	6 2 15.87
Frid.	23	6 8 5.85	10.395	23 26 23.1	2.01	1 53.43	0.538	6 6 12.42
Sat.	24	6 12 15.26	10.390	23 25 22.6	3.04	2 6.28	0.533	6 10 8.98
Sun.	25	6 16 24.56	10.384	23 23 57.3	− 4.07	2 19.02	0.527	6 14 5.54
Mon.	26	6 20 33.72	10.378	23 22 7.4	5.10	2 31.62	0.521	6 18 2.10
Tues.	27	6 24 42.73	10.372	23 19 52.8	6.12	2 44.08	0.515	6 21 58.65
Wed.	28	6 28 51.56	10.364	23 17 13.7	− 7.15	2 56.35	0.507	6 25 55.21
Thur.	29	6 33 0.19	10.355	23 14 10.2	8.17	3 8.42	0.498	6 29 51.77
Frid.	30	6 37 8.60	10.345	23 10 42.1	9.19	3 20.27	0.488	6 33 48.33
Sat.	31	6 41 16.78	10.335	N. 23 6 49.6	− 10.20	3 31.90	0.478	6 37 44.88

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

Diff. for 1 Hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON.								Mean Time of Sidereal Noon.
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	152	70 50 30.6	49 55.5	143.60	0.00	0.0061953	+ 25.7	19 17 21.70
2	153	71 47 56.7	47 21.4	143.56	+ 0.13	0.0062564	25.2	19 13 25.79
3	154	72 45 21.9	44 46.4	143.53	0.23	0.0063163	24.7	19 9 29.88
4	155	73 42 46.2	42 10.6	143.50	+ 0.32	0.0063749	+ 24.2	19 5 33.98
5	156	74 40 9.8	39 34.0	143.47	0.38	0.0064322	23.6	19 1 38.07
6	157	75 37 32.8	36 56.8	143.44	0.40	0.0064881	23.0	18 57 42.16
7	158	76 34 55.3	34 19.1	143.42	+ 0.41	0.0065424	+ 22.3	18 53 46.25
8	159	77 32 17.2	31 40.8	143.40	0.38	0.0065950	21.5	18 49 50.33
9	160	78 29 38.6	29 2.0	143.38	0.33	0.0066458	20.7	18 45 54.41
10	161	79 26 59.5	26 22.8	143.36	+ 0.24	0.0066946	+ 19.9	18 41 58.49
11	162	80 24 20.0	23 43.2	143.35	0.14	0.0067412	19.0	18 38 2.58
12	163	81 21 40.1	21 3.1	143.33	+ 0.01	0.0067855	18.0	18 34 6.68
13	164	82 18 59.7	18 22.5	143.31	− 0.12	0.0068274	+ 17.0	18 30 10.76
14	165	83 16 18.8	15 41.4	143.29	0.26	0.0068669	16.0	18 26 14.85
15	166	84 13 37.5	13 0.0	143.27	0.40	0.0069039	14.9	18 22 18.94
16	167	85 10 55.6	10 18.0	143.24	− 0.53	0.0069384	+ 13.9	18 18 23.04
17	168	86 8 13.2	7 35.4	143.22	0.65	0.0069703	12.8	18 14 27.12
18	169	87 5 30.3	4 52.3	143.19	0.72	0.0069996	11.8	18 10 31.21
19	170	88 2 46.8	2 8.6	143.17	− 0.77	0.0070264	+ 10.7	18 6 35.30
20	171	88 60 2.5	59 24.2	143.14	0.80	0.0070508	9.7	18 2 39.39
21	172	89 57 17.6	56 39.2	143.12	0.81	0.0070728	8.7	17 58 43.47
22	173	90 54 32.1	53 53.5	143.09	− 0.76	0.0070925	+ 7.8	17 54 47.56
23	174	91 51 45.9	51 7.1	143.06	0.71	0.0071100	6.9	17 50 51.65
24	175	92 48 59 2	48 20.2	143.04	0.62	0.0071255	6.1	17 46 55.75
25	176	93 46 11.9	45 32.8	143.02	− 0.52	0.0071392	+ 5.3	17 42 59.83
26	177	94 43 24.2	42 44.9	143.00	0.39	0.0071511	4.6	17 39 3.92
27	178	95 40 36.1	39 56.6	142.99	0.26	0.0071613	3.9	17 35 8.01
28	179	96 37 47.6	37 7.9	142.97	− 0.13	0.0071699	+ 3.2	17 31 12.10
29	180	97 34 58.8	34 19.0	142.96	0.00	0.0071770	2.6	17 27 16.18
30	181	98 32 9.9	31 29.9	142.95	+ 0.11	0.0071826	2.0	17 23 20.27
31	182	99 29 20.8	28 40.6	142.94	+ 0.21	0.0071868	+ 1.5	17 19 24.36

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^{\mathrm{d}}.0$.

Diff. for 1 Hour,
— $9^{\mathrm{s}}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 41.6	15 46.6	57 28.9	+ 1.55	57 47.1	+ 1.47	12 6.2	2.35	15.2
2	15 51.2	15 55.5	58 4.3	1.37	58 20.1	1.25	13 3.2	2.39	16.2
3	15 59.4	16 2.8	58 34.3	1.10	58 46.7	0.96	14 0.5	2.37	17.2
4	16 5.7	16 8.1	58 57.4	+ 0.81	59 6.2	+ 0.65	14 56.8	2.31	18.2
5	16 10.0	16 11.4	59 13.1	0.49	59 18.2	0.34	15 51.4	2.23	19.2
6	16 12.3	16 12.7	59 21.5	+ 0.21	59 23.2	+ 0.08	16 44.2	2.16	20.2
7	16 12.7	16 12.4	59 23.3	− 0.05	59 21.9	− 0.17	17 35.6	2.12	21.2
8	16 11.6	16 10.6	59 19.2	0.27	59 15.3	0.37	18 26.2	2.11	22.2
9	16 9.2	16 7 5	59 10.2	0.47	59 4.0	0.57	19 17.0	2.13	23.2
10	16 5.5	16 3.2	58 56.6	− 0.67	58 48.1	− 0.75	20 8.7	2.18	24.2
11	16 0.6	15 57.7	58 38.6	0.84	58 28.0	0.93	21 1.7	2.24	25.2
12	15 54.5	15 51.1	58 16.4	1.02	58 3.7	1.10	21 56.0	2.28	26.2
13	15 47.4	15 43.4	57 50.1	− 1 18	57 35.5	− 1.25	22 51.1	2.29	27.2
14	15 39.2	15 34.9	57 20.2	1.30	57 4.2	1.35	23 45.9	2.26	28.2
15	15 30.4	15 25.7	56 47.6	1.38	56 30.7	1.41	☌		29.2
16	15 21.1	15 16.6	56 13.8	− 1.40	55 57.1	− 1.38	0 39 3	2.18	0.7
17	15 12.1	15 7.9	55 40.7	1.35	55 25 0	1.27	1 30.4	2.07	1.7
18	15 3.8	15 0.1	55 10.2	1.18	54 56.6	1.07	2 18.9	1.96	2.7
19	14 56.8	14 53.9	54 44.4	− 0.94	54 33.9	− 0.79	3 4.6	1.86	3.7
20	14 51.6	14 49.8	54 25.2	0.63	54 18.6	0.45	3 48.2	1.78	4.7
21	14 48.6	14 48.1	54 14.3	− 0.26	54 12.4	− 0.06	4 30.3	1.73	5.7
22	14 48.2	14 49.1	54 12.9	+ 0.15	54 16.0	+ 0.36	5 11.7	1.72	6.7
23	14 50.6	14 52.9	54 21.7	0.58	54 30.0	0.79	5 53.3	1.75	7.7
24	14 55.8	14 59.4	54 40.7	0.99	54 53.9	1.20	6 36.0	1.81	8.7
25	15 3.6	15 8.4	55 9.4	+ 1.38	55 27.1	+ 1.55	7 20.6	1.91	9.7
26	15 13.8	15 19.6	55 46.7	1.69	56 8.0	1.81	8 8.0	2.04	10.7
27	15 25.7	15 32.1	56 30.5	1.91	56 54.0	1.98	8 58.7	2.18	11.7
28	15 38.6	15 45.2	57 18.0	+ 2.00	57 42.1	+ 1.99	9 52.7	2.32	12.7
29	15 51.6	15 57.8	58 5.7	1.92	58 28.3	1.82	10 49.4	2.41	13.7
30	16 3.5	16 8.8	58 49.5	1.69	59 8.8	1.51	11 47.6	2.44	14.7
31	16 13.4	16 17.3	59 25.7	+ 1.29	59 39.9	+ 1.06	12 45.9	2.41	15.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	THURSDAY 1.					SATURDAY 3			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 18 33.30	2.3853	S.20 47 11.5	2.679	0	18 15 43.59	2.4634	S.20 27 24.9	3.596
1	16 20 56.53	2.3889	20 49 48.6	2.558	1	18 18 11.38	2.4629	20 23 45.2	3.728
2	16 23 19.97	2.3924	20 52 18.5	2.437	2	18 20 39.14	2.4623	20 19 57.6	3.859
3	16 25 43.61	2.3958	20 54 41.1	2.315	3	18 23 6.86	2.4617	20 16 2.1	3.990
4	16 28 7.46	2.3992	20 56 56.3	2.191	4	18 25 34.54	2.4609	20 11 58.8	4.121
5	16 30 31.51	2.4024	20 59 4.0	2.067	5	18 28 2.17	2.4600	20 7 47.6	4.252
6	16 32 55.75	2.4055	21 1 4.3	1.942	6	18 30 29.74	2.4591	20 3 28.6	4.382
7	16 35 20.18	2.4087	21 2 57.1	1.817	7	18 32 57.26	2.4581	19 59 1.8	4.511
8	16 37 44.80	2.4118	21 4 42.3	1.691	8	18 35 24.71	2.4570	19 54 27.3	4.640
9	16 40 9.60	2.4148	21 6 20.0	1.565	9	18 37 52.10	2.4558	19 49 45.0	4.769
10	16 42 34.58	2.4177	21 7 50.1	1.438	10	18 40 19.41	2.4546	19 44 55.0	4.898
11	16 44 59.73	2.4205	21 9 12.5	1.310	11	18 42 46.65	2.4533	19 39 57.4	5.024
12	16 47 25.04	2.4232	21 10 27.3	1.182	12	18 45 13.81	2.4520	19 34 52.1	5.152
13	16 49 50.52	2.4259	21 11 34.4	1.053	13	18 47 40.89	2.4505	19 29 39.2	5.278
14	16 52 16.15	2.4284	21 12 33.7	0.923	14	18 50 7.87	2.4489	19 24 18.8	5.404
15	16 54 41.93	2.4309	21 13 25.2	0.794	15	18 52 34.76	2.4173	19 18 50.8	5.529
16	16 57 7.86	2.4334	21 14 9.0	0.665	16	18 55 1.55	2.4457	19 13 15.3	5.653
17	16 59 33.94	2.4357	21 14 45.0	0.534	17	18 57 28.24	2.4439	19 7 32.4	5.777
18	17 2 0.15	2.4379	21 15 13.1	0.403	18	18 59 54.82	2.4421	19 1 42.1	5.900
19	17 4 26.49	2.4401	21 15 33.3	0.272	19	19 2 21.29	2.4402	18 55 44.4	6.022
20	17 6 52.96	2.4422	21 15 45.7	0.141	20	19 4 47.65	2.4384	18 49 39.4	6.144
21	17 9 19.55	2.4442	21 15 50.2	− 0.009	21	19 7 13.90	2.4365	18 43 27.1	6.265
22	17 11 46.26	2.4460	21 15 46.8	+ 0.124	22	19 9 40.03	2.4344	18 37 7.6	6.385
23	17 14 13.07	2.4478	S.21 15 35.4	0.257	23	19 12 6.03	2.4322	S.18 30 40.9	6.505
	FRIDAY 2.					SUNDAY 4.			
0	17 16 39.99	2.4495	S.21 15 16.0	0.390	0	19 14 31.90	2.4301	S.18 24 7.0	6.624
1	17 19 7.01	2.4512	21 14 48.6	0.522	1	19 16 57.64	2.4279	18 17 26.0	6.742
2	17 21 34.13	2.4527	21 14 13.3	0.655	2	19 19 23.25	2.4257	18 10 38.0	6.859
3	17 24 1.33	2.4541	21 13 30.0	0.788	3	19 21 48.73	2.4235	18 3 43.0	6.975
4	17 26 28.62	2.4555	21 12 38.7	0.922	4	19 24 14.07	2.4212	17 56 41.0	7.091
5	17 28 55.99	2.4567	21 11 39.4	1.056	5	19 26 39.27	2.4188	17 49 32.1	7.205
6	17 31 23.43	2.4579	21 10 32.0	1.190	6	19 29 4.32	2.4164	17 42 16.4	7.318
7	17 33 50.94	2.4590	21 9 16.6	1.323	7	19 31 29.23	2.4139	17 34 53.9	7.431
8	17 36 18.51	2.4599	21 7 53.2	1.457	8	19 33 53.99	2.4113	17 27 24.6	7.543
9	17 38 46.13	2.4607	21 6 21.7	1.592	9	19 36 18.59	2.4088	17 19 48.7	7.653
10	17 41 13.80	2.4616	21 4 42.2	1.726	10	19 38 43.04	2.4062	17 12 6.2	7.763
11	17 43 41.52	2.4624	21 2 54.6	1.861	11	19 41 7.33	2.4035	17 4 17.1	7.872
12	17 46 9.29	2.4631	21 0 58.9	1.995	12	19 43 31.46	2.4008	16 56 21.5	7.981
13	17 48 37.09	2.4635	20 58 55.2	2.128	13	19 45 55.43	2.3982	16 48 19.4	8.088
14	17 51 4.91	2.4639	20 56 43.5	2.262	14	19 48 19.24	2.3954	16 40 10.9	8.193
15	17 53 32.76	2.4643	20 54 23.7	2.397	15	19 50 42.88	2.3927	16 31 56.2	8.298
16	17 56 0.63	2.4646	20 51 55.9	2.531	16	19 53 6.36	2.3899	16 23 35.2	8.402
17	17 58 28 51	2.4647	20 49 20.0	2.665	17	19 55 29.67	2.3871	16 15 8.0	8.505
18	18 0 56.40	2.4648	20 46 36.1	2.798	18	19 57 52.81	2.3842	16 6 34.6	8.607
19	18 3 24.29	2.4648	20 43 44.2	2.932	19	20 0 15.78	2.3814	15 57 55.1	8.707
20	18 5 52.18	2.4647	20 40 44.3	3.065	20	20 2 38.58	2.3785	15 49 9.7	8.807
21	18 8 20.06	2.4646	20 37 36.4	3.198	21	20 5 1.20	2.3756	15 40 18.3	8.906
22	18 10 47.93	2.4642	20 34 20.5	3.331	22	20 7 23.65	2.3727	15 31 21.0	9.003
23	18 13 15.77	2.4638	20 30 56.7	3.463	23	20 9 45.92	2.3698	15 22 17.9	9.099
24	18 15 43.59	2.4634	S.20 27 24.9	3.596	24	20 12 8.02	2.3669	S.15 13 9.1	9.194

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	20 12 8.02	2.3669	S. 15 13 9.1	9.194
1	20 14 29.95	2.3639	15 3 54.6	9.289
2	20 16 51.69	2.3608	14 54 34.4	9.382
3	20 19 13.25	2.3578	14 45 8.7	9.473
4	20 21 34.63	2.3549	14 35 37.6	9.564
5	20 23 55.84	2.3520	14 26 1.0	9.654
6	20 26 16.87	2.3490	14 16 19.1	9.742
7	20 28 37.72	2.3460	14 6 31.9	9.830
8	20 30 58.39	2.3430	13 56 39.5	9.916
9	20 33 18.88	2.3400	13 46 42.0	10.001
10	20 35 39.19	2.3370	13 36 39.4	10.085
11	20 37 59.32	2.3340	13 26 31.8	10.167
12	20 40 19.27	2.3310	13 16 19.3	10.249
13	20 42 39.04	2.3281	13 6 1.9	10.329
14	20 44 58.64	2.3252	12 55 39.8	10.407
15	20 47 18.06	2.3222	12 45 13.0	10.485
16	20 49 37.30	2.3192	12 34 41.6	10.562
17	20 51 56.36	2.3162	12 24 5.6	10.637
18	20 54 15.25	2.3133	12 13 25.2	10.710
19	20 56 33.96	2.3104	12 2 40.4	10.783
20	20 58 52.50	2.3076	11 51 51.2	10.855
21	21 1 10.87	2.3047	11 40 57.8	10.925
22	21 3 29.07	2.3018	11 30 0.2	10.994
23	21 5 47.09	2.2989	S. 11 18 58.5	11.062

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	21 8 4.94	2.2962	S. 11 7 52.7	11.129
1	21 10 22.63	2.2934	10 56 43.0	11.194
2	21 12 40.15	2.2906	10 45 29.4	11.258
3	21 14 57.50	2.2878	10 34 12.0	11.321
4	21 17 14.69	2.2851	10 22 50.9	11.382
5	21 19 31.72	2.2825	10 11 26.1	11.442
6	21 21 48.59	2.2798	9 59 57.8	11.501
7	21 24 5.30	2.2772	9 48 26.0	11.559
8	21 26 21.85	2.2746	9 36 50.7	11.616
9	21 28 38.25	2.2721	9 25 12.1	11.871
10	21 30 54.50	2.2696	9 13 30.2	11.725
11	21 33 10.60	2.2670	9 1 45.1	11.777
12	21 35 26.54	2.2645	8 49 56.9	11.829
13	21 37 42.34	2.2621	8 38 5.6	11.879
14	21 39 58.00	2.2597	8 26 11.4	11.927
15	21 42 13.51	2.2574	8 14 14.3	11.975
16	21 44 28.88	2.2551	8 2 14.4	12.022
17	21 46 44.12	2.2528	7 50 11.7	12.067
18	21 48 59.22	2.2505	7 38 6.3	12.111
19	21 51 14.18	2.2483	7 25 58.4	12.153
20	21 53 29.02	2.2462	7 13 48.0	12.194
21	21 55 43.73	2.2442	7 1 35.1	12.235
22	21 57 58.32	2.2421	6 49 19.8	12.273
23	22 0 12.78	2.2400	6 37 2.3	12.310
24	22 2 27.12	2.2380	S. 6 24 42.6	12.346

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	22 2 27.12	2.2380	S. 6 24 42.6	12.346
1	22 4 41.34	2.2361	6 12 20.8	12.381
2	22 6 55.45	2.2342	5 59 56.9	12.415
3	22 9 9.45	2.2324	5 47 31.0	12.447
4	22 11 23.34	2.2307	5 35 3.2	12.478
5	22 13 37.13	2.2289	5 22 33.6	12.507
6	22 15 50.81	2.2272	5 10 2.3	12.536
7	22 18 4.39	2.2255	4 57 29.3	12.563
8	22 20 17.87	2.2239	4 44 54.7	12.590
9	22 22 31.26	2.2223	4 32 18.5	12.615
10	22 24 44.55	2.2208	4 19 40.9	12.638
11	22 26 57.76	2.2194	4 7 1.9	12.661
12	22 29 10.88	2.2180	3 54 21.6	12.682
13	22 31 23.92	2.2167	3 41 40.1	12.702
14	22 33 36.88	2.2153	3 28 57.4	12.720
15	22 35 49.76	2.2141	3 16 13.7	12.737
16	22 38 2.57	2.2129	3 3 29.0	12.752
17	22 40 15.31	2.2117	2 50 43.4	12.767
18	22 42 27.98	2.2106	2 37 56.9	12.781
19	22 44 40.58	2.2096	2 25 9.7	12.793
20	22 46 53.13	2.2087	2 12 21.8	12.804
21	22 49 5.62	2.2078	1 59 33.2	12.814
22	22 51 18.06	2.2069	1 46 44.1	12.822
23	22 53 30.45	2.2060	S. 1 33 54.5	12.830

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 55 42.78	2.2052	S. 1 21 4.5	12.836
1	22 57 55.07	2.2045	1 8 14.2	12.841
2	23 0 7.32	2.2038	0 55 23.6	12.844
3	23 2 19.53	2.2032	0 42 32.9	12.846
4	23 4 31.71	2.2027	0 29 42.1	12.847
5	23 6 43.86	2.2022	0 16 51.2	12.847
6	23 8 55.97	2.2017	S. 0 4 0.4	12.846
7	23 11 8.06	2.2013	N. 0 8 50.3	12.843
8	23 13 20.13	2.2010	0 21 40.8	12.839
9	23 15 32.18	2.2007	0 34 31.0	12.834
10	23 17 44.21	2.2004	0 47 20.9	12.828
11	23 19 56.23	2.2002	1 0 10.4	12.821
12	23 22 8.24	2.2002	1 12 59.4	12.811
13	23 24 20.25	2.2001	1 25 47.8	12.802
14	23 26 32.25	2.2000	1 38 35.6	12.791
15	23 28 44.25	2.2001	1 51 22.7	12.778
16	23 30 56.26	2.2002	2 4 9.0	12.765
17	23 33 8.27	2.2003	2 16 54.5	12.750
18	23 35 20.29	2.2005	2 29 39.0	12.734
19	23 37 32.33	2.2007	2 42 22.5	12.717
20	23 39 44.38	2.2010	2 55 5.0	12.698
21	23 41 56.45	2.2013	3 7 46.3	12.678
22	23 44 8.54	2.2017	3 20 26.4	12.657
23	23 46 20.66	2.2022	3 33 5.2	12.636
24	23 48 32.81	2.2027	N. 3 45 42.7	12.613

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 9.					SUNDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 48 32.81	2.2027	N. 3 45 42.7	12.613	0	1 35 41.79	2.2753	N.13 2 2.5	10.129
1	23 50 44.99	2.2033	3 58 18.8	12.589	1	1 37 58.37	2.2775	13 12 7.9	10.051
2	23 52 57.21	2.2039	4 10 53.4	12.562	2	1 40 15.09	2.2797	13 22 8.6	9.971
3	23 55 9.46	2.2045	4 23 26.3	12.535	3	1 42 31.94	2.2819	13 32 4.4	9.889
4	23 57 21.75	2.2052	4 35 57.6	12.507	4	1 44 48.92	2.2841	13 41 55.3	9.807
5	23 59 34.09	2.2060	4 48 27.2	12.478	5	1 47 6.03	2.2863	13 51 41.3	9.725
6	0 1 46.47	2.2068	5 0 55.0	12.448	6	1 49 23.27	2.2885	14 1 22.3	9.640
7	0 3 58.90	2.2077	5 13 21.0	12.417	7	1 51 40.65	2.2907	14 10 58.1	9.554
8	0 6 11.39	2.2086	5 25 45.0	12.383	8	1 53 58.16	2.2929	14 20 28.8	9.468
9	0 8 23.93	2.2095	5 38 7.0	12.349	9	1 56 15.80	2.2952	14 29 54.3	9.381
10	0 10 36.53	2.2105	5 50 26.9	12.314	10	1 58 33.58	2.2974	14 39 14.5	9.293
11	0 12 49.19	2.2115	6 2 44.7	12.278	11	2 0 51.49	2.2996	14 48 29.5	9.205
12	0 15 1.91	2.2126	6 15 0.3	12.241	12	2 3 9.53	2.3018	14 57 39.1	9.115
13	0 17 14.70	2.2137	6 27 13.6	12.202	13	2 5 27.70	2.3040	15 6 43.3	9.024
14	0 19 27.56	2.2149	6 39 24.6	12.162	14	2 7 46.01	2.3062	15 15 42.0	8.932
15	0 21 40.49	2.2161	6 51 33.1	12.121	15	2 10 4.45	2.3084	15 24 35.1	8.839
16	0 23 53.49	2.2173	7 3 39.1	12.079	16	2 12 23.02	2.3106	15 33 22.6	8.745
17	0 26 6.57	2.2187	7 15 42.6	12.036	17	2 14 41.72	2.3128	15 42 4.5	8.650
18	0 28 19.73	2.2200	7 27 43.4	11.991	18	2 17 0.56	2.3150	15 50 40.6	8.554
19	0 30 32.97	2.2214	7 39 41.5	11.946	19	2 19 19.52	2.3171	15 59 11.0	8.458
20	0 32 46.30	2.2228	7 51 36.9	11.899	20	2 21 38.61	2.3193	16 7 35.6	8.360
21	0 34 59.71	2.2242	8 3 29.4	11.851	21	2 23 57.83	2.3214	16 15 54.2	8.261
22	0 37 13.21	2.2257	8 15 19.0	11.802	22	2 26 17.18	2.3235	16 24 6.9	8.162
23	0 39 26.80	2.2273	N. 8 27 5.6	11.751	23	2 28 36.65	2.3255	N.16 32 13.7	8.063
	SATURDAY 10.					MONDAY 12.			
0	0 41 40.49	2.2289	N. 8 38 49.1	11.699	0	2 30 56.24	2.3275	N.16 40 14.5	7.962
1	0 43 54.27	2.2305	8 50 29.5	11.647	1	2 33 15.95	2.3296	16 48 9.2	7.860
2	0 46 8.15	2.2321	9 2 6.7	11.593	2	2 35 35.79	2.3317	16 55 57.7	7.757
3	0 48 22.12	2.2338	9 13 40.7	11.539	3	2 37 55.75	2.3337	17 3 40.0	7.653
4	0 50 36.20	2.2355	9 25 11.4	11.483	4	2 40 15.83	2.3356	17 11 16.1	7.550
5	0 52 50.38	2.2373	9 36 38.7	11.425	5	2 42 36.02	2.3375	17 18 46.0	7.446
6	0 55 4.67	2.2391	9 48 2.4	11.366	6	2 44 56.33	2.3394	17 26 9.6	7.340
7	0 57 19.07	2.2409	9 59 22.6	11.307	7	2 47 16.75	2.3413	17 33 26.8	7.233
8	0 59 33.58	2.2427	10 10 39.3	11.247	8	2 49 37.28	2.3432	17 40 37.5	7.125
9	1 1 48.19	2.2445	10 21 52.3	11.186	9	2 51 57.93	2.3450	17 47 41.8	7.017
10	1 4 2.92	2.2464	10 33 1.6	11.123	10	2 54 18.68	2.3467	17 54 39.6	6.908
11	1 6 17.76	2.2483	10 44 7.1	11.059	11	2 56 39.53	2.3484	18 1 30.8	6.798
12	1 8 32.72	2.2503	10 55 8.7	10.993	12	2 59 0.49	2.3502	18 8 15.4	6.688
13	1 10 47.80	2.2523	11 6 6.3	10.927	13	3 1 21.55	2.3519	18 14 53.4	6.578
14	1 13 3.00	2.2542	11 17 0.0	10.861	14	3 3 42.71	2.3535	18 21 24.7	6.467
15	1 15 18.31	2.2562	11 27 49.6	10.793	15	3 6 3.97	2.3551	18 27 49.4	6.355
16	1 17 33.75	2.2583	11 38 35.1	10.723	16	3 8 25.32	2.3566	18 34 7.3	6.242
17	1 19 49.31	2.2604	11 49 16.4	10.652	17	3 10 46.76	2.3580	18 40 18.4	6.128
18	1 22 5.00	2.2625	11 59 53.4	10.581	18	3 13 8.28	2.3594	18 46 22.6	6.013
19	1 24 20.81	2.2646	12 10 26.1	10.508	19	3 15 29.89	2.3608	18 52 20.0	5.899
20	1 26 36.75	2.2667	12 20 54.4	10.435	20	3 17 51.58	2.3622	18 58 10.5	5.783
21	1 28 52.82	2.2689	12 31 18.3	10.361	21	3 20 13.36	2.3636	19 3 54.0	5.668
22	1 31 9.02	2.2710	12 41 37.7	10.284	22	3 22 35.21	2.3648	19 9 30.6	5.552
23	1 33 25.34	2.2731	12 51 52.4	10.207	23	3 24 57.13	2.3659	19 15 0.2	5.435
24	1 35 41.79	2.2753	N.13 2 2.5	10.129	24	3 27 19.12	2.3671	N.19 20 22.8	5.317

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	3 27 19.12	2.3671	N.19 20 22.8	5.317
1	3 29 41.18	2.3682	19 25 38.3	5.200
2	3 32 3.30	2.3692	19 30 46.8	5.082
3	3 34 25.49	2.3702	19 35 48.1	4.962
4	3 36 47.73	2.3711	19 40 42.2	4.843
5	3 39 10.02	2.3719	19 45 29.2	4.723
6	3 41 32.36	2.3727	19 50 9.0	4.603
7	3 43 54.75	2.3735	19 54 41.6	4.482
8	3 46 17.18	2.3742	19 59 6.9	4.361
9	3 48 39.65	2.3748	20 3 24.9	4.240
10	3 51 2.16	2.3753	20 7 35.7	4.118
11	3 53 24.69	2.3758	20 11 39.1	3.996
12	3 55 47.25	2.3763	20 15 35.2	3.874
13	3 58 9.84	2.3766	20 19 24.0	3.751
14	4 0 32.44	2.3768	20 23 5.4	3.628
15	4 2 55.06	2.3771	20 26 39.4	3.505
16	4 5 17.69	2.3773	20 30 6.0	3.382
17	4 7 40.33	2.3773	20 33 25.2	3.258
18	4 10 2.97	2.3773	20 36 37.0	3.134
19	4 12 25.61	2.3773	20 39 41.3	3.010
20	4 14 48.24	2.3772	20 42 38.2	2.887
21	4 17 10.87	2.3770	20 45 27.7	2.763
22	4 19 33.48	2.3767	20 48 9.7	2.638
23	4 21 56.07	2.3763	N.20 50 44.2	2.513

WEDNESDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	4 24 18.63	2.3759	N.20 53 11.3	2.389
1	4 26 41.17	2.3754	20 55 30.9	2.264
2	4 29 3.68	2.3748	20 57 43.0	2.139
3	4 31 26.15	2.3742	20 59 47.6	2.014
4	4 33 48.58	2.3735	21 1 44.7	1.890
5	4 36 10.97	2.3727	21 3 34.4	1.766
6	4 38 33.31	2.3718	21 5 16.6	1.641
7	4 40 55.59	2.3708	21 6 51.3	1.516
8	4 43 17.81	2.3699	21 8 18.5	1.391
9	4 45 39.98	2.3689	21 9 38.2	1.267
10	4 48 2.08	2.3677	21 10 50.5	1.142
11	4 50 24.10	2.3664	21 11 55.3	1.018
12	4 52 46.05	2.3651	21 12 52.7	0.894
13	4 55 7.92	2.3637	21 13 42.6	0.770
14	4 57 29.70	2.3622	21 14 25.1	0.647
15	4 59 51.39	2.3607	21 15 0.2	0.523
16	5 2 12.99	2.3592	21 15 27.9	0.400
17	5 4 34.49	2.3575	21 15 48.2	0.277
18	5 6 55.89	2.3557	21 16 1.1	0.153
19	5 9 17.18	2.3539	21 16 6.6	+ 0.031
20	5 11 38.36	2.3521	21 16 4.8	− 0.091
21	5 13 59.43	2.3502	21 15 55.7	0.212
22	5 16 20.38	2.3481	21 15 39.3	0.334
23	5 18 41.20	2.3460	21 15 15.6	0.456
24	5 21 1.90	2.3439	N.21 14 44.6	0.577

THURSDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 21 1.90	2.3439	N.21 14 44.6	0.577
1	5 23 22.47	2.3417	21 14 6.4	0.697
2	5 25 42.90	2.3393	21 13 21.0	0.817
3	5 28 3.18	2.3368	21 12 28.3	0.937
4	5 30 23.32	2.3344	21 11 28.5	1.057
5	5 32 43.31	2.3320	21 10 21.5	1.176
6	5 35 3.16	2.3295	21 9 7.4	1.294
7	5 37 22.85	2.3268	21 7 46.2	1.412
8	5 39 42.37	2.3240	21 6 17.9	1.530
9	5 42 1.73	2.3212	21 4 42.6	1.647
10	5 44 20.92	2.3184	21 3 0.3	1.763
11	5 46 39.94	2.3156	21 1 11.0	1.879
12	5 48 58.79	2.3127	20 59 14.8	1.994
13	5 51 17.46	2.3096	20 57 11.7	2.109
14	5 53 35.94	2.3065	20 55 1.7	2.224
15	5 55 54.24	2.3034	20 52 44.8	2.338
16	5 58 12.35	2.3003	20 50 21.1	2.451
17	6 0 30.27	2.2971	20 47 50.7	2.564
18	6 2 48.00	2.2938	20 45 13.5	2.676
19	6 5 5.53	2.2904	20 42 29.6	2.787
20	6 7 22.85	2.2870	20 39 39.1	2.897
21	6 9 39.97	2.2837	20 36 41.9	3.007
22	6 11 56.89	2.2802	20 33 38.2	3.117
23	6 14 13.59	2.2766	N.20 30 27.9	3.226

FRIDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 16 30.08	2.2730	N.20 27 11.1	3.334
1	6 18 46.35	2.2693	20 23 47.8	3.441
2	6 21 2.40	2.2657	20 20 18.1	3.547
3	6 23 18.24	2.2621	20 16 42.1	3.653
4	6 25 33.85	2.2583	20 12 59.7	3.759
5	6 27 49.23	2.2545	20 9 11.0	3.863
6	6 30 4.39	2.2507	20 5 16.1	3.967
7	6 32 19.32	2.2468	20 1 15.0	4.070
8	6 34 34.01	2.2429	19 57 7.7	4.172
9	6 36 48.47	2.2390	19 52 54.3	4.274
10	6 39 2.69	2.2350	19 48 34.8	4.374
11	6 41 16.67	2.2310	19 44 9.4	4.473
12	6 43 30.41	2.2270	19 39 38.0	4.573
13	6 45 43.91	2.2229	19 35 0.6	4.672
14	6 47 57.16	2.2188	19 30 17.4	4.768
15	6 50 10.17	2.2147	19 25 28.4	4.865
16	6 52 22.93	2.2106	19 20 33.6	4.961
17	6 54 35.44	2.2064	19 15 33.1	5.056
18	6 56 47.70	2.2022	19 10 26.9	5.150
19	6 58 59.71	2.1980	19 5 15.1	5.243
20	7 1 11.46	2.1938	18 59 57.7	5.336
21	7 3 22.96	2.1896	18 54 34.7	5.428
22	7 5 34.21	2.1853	18 49 6.3	5.519
23	7 7 45.20	2.1810	18 43 32.4	5.610
24	7 9 55.93	2.1767	N.18 37 53.1	5.699

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 9 55.93	2.1767	N.18 37 53.1	5.699
1	7 12 6.40	2.1723	18 32 8.5	5.787
2	7 14 16.61	2.1681	18 26 18.7	5.874
3	7 16 26.57	2.1638	18 20 23.6	5.961
4	7 18 36.27	2.1595	18 14 23.3	6.047
5	7 20 45.71	2.1552	18 8 17.9	6.132
6	7 22 54.89	2.1508	18 2 7.5	6.216
7	7 25 3.81	2.1464	17 55 52.0	6.299
8	7 27 12.46	2.1420	17 49 31.6	6.382
9	7 29 20.85	2.1377	17 43 6.2	6.464
10	7 31 28.98	2.1333	17 36 35.9	6.544
11	7 33 36.85	2.1289	17 30 0.9	6.623
12	7 35 44.45	2.1246	17 23 21.1	6.702
13	7 37 51.80	2.1202	17 16 36.6	6.781
14	7 39 58.88	2.1158	17 9 47.4	6.858
15	7 42 5.70	2.1115	17 2 53.6	6.934
16	7 44 12.26	2.1072	16 55 55.3	7.010
17	7 46 18.56	2.1028	16 48 52.4	7.085
18	7 48 24.60	2.0985	16 41 45.1	7.158
19	7 50 30.38	2.0942	16 34 33.4	7.231
20	7 52 35.90	2.0898	16 27 17.3	7.303
21	7 54 41.16	2.0856	16 19 57.0	7.374
22	7 56 46.17	2.0813	16 12 32.4	7.445
23	7 58 50.92	2.0770	N.16 5 3.6	7.514

SUNDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 0 55.41	2.0727	N.15 57 30.7	7.583
1	8 2 59.65	2.0685	15 49 53.7	7.651
2	8 5 3.63	2.0643	15 42 12.6	7.717
3	8 7 7.36	2.0601	15 34 27.6	7.783
4	8 9 10.84	2.0559	15 26 38.6	7.849
5	8 11 14.07	2.0516	15 18 45.7	7.912
6	8 13 17.04	2.0474	15 10 49.1	7.975
7	8 15 19.76	2.0433	15 2 48.7	8.038
8	8 17 22.24	2.0393	14 54 44.5	8.101
9	8 19 24.48	2.0352	14 46 36.6	8.162
10	8 21 26.47	2.0312	14 38 25.1	8.222
11	8 23 28.22	2.0272	14 30 10.0	8.282
12	8 25 29.73	2.0232	14 21 51.3	8.340
13	8 27 31.00	2.0192	14 13 29.2	8.397
14	8 29 32.03	2.0152	14 5 3.7	8.454
15	8 31 32.82	2.0112	13 56 34.7	8.511
16	8 33 33.38	2.0073	13 48 2.4	8.566
17	8 35 33.70	2.0034	13 39 26.8	8.620
18	8 37 33.79	1.9996	13 30 48.0	8.673
19	8 39 33.65	1.9958	13 22 6.0	8.726
20	8 41 33.29	1.9921	13 13 20.9	8.778
21	8 43 32.70	1.9884	13 4 32.6	8.830
22	8 45 31.89	1.9847	12 55 41.3	8.880
23	8 47 30.86	1.9810	12 46 47.0	8.930
24	8 49 29.61	1.9773	N.12 37 49.7	8.979

MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	8 49 29.61	1.9773	N.12 37 49.7	8.979
1	8 51 28.14	1.9737	12 28 49.5	9.027
2	8 53 26.46	1.9702	12 19 46.5	9.074
3	8 55 24.56	1.9666	12 10 40.6	9.121
4	8 57 22.45	1.9632	12 1 31.9	9.167
5	8 59 20.14	1.9597	11 52 20.5	9.212
6	9 1 17.62	1.9562	11 43 6.5	9.256
7	9 3 14.89	1.9528	11 33 49.8	9.300
8	9 5 11.96	1.9496	11 24 30.5	9.342
9	9 7 8.84	1.9463	11 15 8.7	9.384
10	9 9 5.52	1.9431	11 5 44.4	9.426
11	9 11 2.01	1.9398	10 56 17.6	9.467
12	9 12 58.30	1.9366	10 46 48.4	9.506
13	9 14 54.40	1.9335	10 37 16.9	9.545
14	9 16 50.32	1.9305	10 27 43.0	9.584
15	9 18 46.06	1.9275	10 18 6.8	9.622
16	9 20 41.62	1.9245	10 8 28.3	9.659
17	9 22 37.00	1.9215	9 58 47.7	9.695
18	9 24 32.20	1.9186	9 49 4.9	9.731
19	9 26 27.23	1.9157	9 39 20.0	9.766
20	9 28 22.09	1.9130	9 29 33.0	9.800
21	9 30 16.79	1.9102	9 19 44.0	9.834
22	9 32 11.32	1.9075	9 9 53.0	9.867
23	9 34 5.69	1.9048	N. 9 0 0.0	9.899

TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 35 59.90	1.9022	N. 8 50 5.1	9.930
1	9 37 53.96	1.8997	8 40 8.4	9.961
2	9 39 47.86	1.8971	8 30 9.8	9.992
3	9 41 41.61	1.8946	8 20 9.4	10.021
4	9 43 35.21	1.8922	8 10 7.3	10.049
5	9 45 28.67	1.8898	8 0 3.5	10.077
6	9 47 21.99	1.8875	7 49 58.0	10.105
7	9 49 15.17	1.8852	7 39 50.9	10.132
8	9 51 8.22	1.8830	7 29 42.2	10.158
9	9 53 1.13	1.8808	7 19 31.9	10.184
10	9 54 53.92	1.8787	7 9 20.1	10.209
11	9 56 46.58	1.8767	6 59 6.8	10.233
12	9 58 39.12	1.8747	6 48 52.1	10.257
13	10 0 31.54	1.8727	6 38 36.0	10.280
14	10 2 23.84	1.8708	6 28 18.5	10.302
15	10 4 16.03	1.8689	6 17 59.7	10.324
16	10 6 8.11	1.8671	6 7 39.6	10.345
17	10 8 0.08	1.8654	5 57 18.3	10.366
18	10 9 51.95	1.8637	5 46 55.7	10.387
19	10 11 43.72	1.8620	5 36 31.9	10.406
20	10 13 35.39	1.8603	5 26 7.0	10.424
21	10 15 26.96	1.8587	5 15 41.0	10.442
22	10 17 18.44	1.8573	5 5 13.9	10.460
23	10 19 9.84	1.8559	4 54 45.8	10.477
24	10 21 1.15	1.8545	N. 4 44 16.7	10.493

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 21 1.15	1.8545	N. 4 44 16.7	10.493
1	10 22 52.38	1.8532	4 33 46.6	10.509
2	10 24 43.53	1.8519	4 23 15.6	10.524
3	10 26 34.61	1.8507	4 12 43.7	10.538
4	10 28 25.62	1.8496	4 2 11.0	10.553
5	10 30 16.56	1.8484	3 51 37.4	10.567
6	10 32 7.43	1.8473	3 41 3.0	10.579
7	10 33 58.24	1.8464	3 30 27.9	10.591
8	10 35 49.00	1.8455	3 19 52.1	10.603
9	10 37 39.70	1.8446	3 9 15.5	10.615
10	10 39 30.35	1.8438	2 58 38.3	10.625
11	10 41 20.95	1.8430	2 48 0.5	10.635
12	10 43 11.51	1.8423	2 37 22.1	10.644
13	10 45 2.03	1.8417	2 26 43.2	10.653
14	10 46 52.51	1.8410	2 16 3.8	10.662
15	10 48 42.95	1.8404	2 5 23.8	10.670
16	10 50 33.36	1.8400	1 54 43.4	10.677
17	10 52 23.75	1.8396	1 44 2.6	10.683
18	10 54 14.11	1.8392	1 33 21.5	10.688
19	10 56 4.45	1.8389	1 22 40.0	10.694
20	10 57 54.78	1.8387	1 11 58.2	10.699
21	10 59 45.09	1.8384	1 1 16.1	10.703
22	11 1 35.39	1.8382	0 50 33.8	10.707
23	11 3 25.68	1.8382	N. 0 39 51.3	10.711

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 5 15.97	1.8382	N. 0 29 8.5	10.714
1	11 7 6.26	1.8382	0 18 25.6	10.716
2	11 8 56.56	1.8383	N. 0 7 42.6	10.717
3	11 10 46.86	1.8384	S. 0 3 0.4	10.718
4	11 12 37.17	1.8387	0 13 43.5	10.718
5	11 14 27.50	1.8389	0 24 26.6	10.718
6	11 16 17.84	1.8392	0 35 9.6	10.717
7	11 18 8.20	1.8396	0 45 52.6	10.716
8	11 19 58.59	1.8401	0 56 35.5	10.714
9	11 21 49.01	1.8406	1 7 18.3	10.712
10	11 23 39.46	1.8411	1 18 0.9	10.709
11	11 25 29.94	1.8417	1 28 43.3	10.706
12	11 27 20.46	1.8424	1 39 25.6	10.702
13	11 29 11.03	1.8432	1 50 7.6	10.697
14	11 31 1.64	1.8439	2 0 49.3	10.692
15	11 32 52.30	1.8447	2 11 30.6	10.686
16	11 34 43.01	1.8457	2 22 11.6	10.680
17	11 36 33.78	1.8467	2 32 52.2	10.673
18	11 38 24.61	1.8477	2 43 32.3	10.665
19	11 40 15.50	1.8487	2 54 12.0	10.657
20	11 42 6.45	1.8498	3 4 51.2	10.649
21	11 43 57.47	1.8510	3 15 29.9	10.640
22	11 45 48.57	1.8523	3 26 8.0	10.630
23	11 47 39.75	1.8537	3 36 45.5	10.619
24	11 49 31.01	1.8550	S. 3 47 22.3	10.608

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 49 31.01	1.8550	S. 3 47 22.3	10.608
1	11 51 22.35	1.8564	3 57 58.5	10.597
2	11 53 13.78	1.8579	4 8 34.0	10.585
3	11 55 5.30	1.8595	4 19 8.7	10.572
4	11 56 56.92	1.8611	4 29 42.7	10.559
5	11 58 48.64	1.8627	4 40 15.8	10.545
6	12 0 40.45	1.8644	4 50 48.1	10.531
7	12 2 32.37	1.8662	5 1 19.5	10.516
8	12 4 24.40	1.8681	5 11 50.0	10.500
9	12 6 16.54	1.8700	5 22 19.5	10.483
10	12 8 8.80	1.8720	5 32 48.0	10.467
11	12 10 1.18	1.8739	5 43 15.5	10.450
12	12 11 53.67	1.8759	5 53 42.0	10.432
13	12 13 46.29	1.8781	6 4 7.4	10.413
14	12 15 39.05	1.8804	6 14 31.6	10.393
15	12 17 31.94	1.8827	6 24 54.6	10.373
16	12 19 24.97	1.8849	6 35 16.4	10.353
17	12 21 18.13	1.8872	6 45 36.9	10.332
18	12 23 11.43	1.8896	6 55 56.2	10.310
19	12 25 4.88	1.8921	7 6 14.1	10.288
20	12 26 58.49	1.8947	7 16 30.7	10.265
21	12 28 52.25	1.8973	7 26 45.9	10.241
22	12 30 46.16	1.8999	7 36 59.6	10.216
23	12 32 40.24	1.9026	S. 7 47 11.8	10.191

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 34 34.48	1.9053	S. 7 57 22.6	10.166
1	12 36 28.88	1.9082	8 7 31.8	10.139
2	12 38 23.46	1.9111	8 17 39.3	10.112
3	12 40 18.21	1.9140	8 27 45.2	10.084
4	12 42 13.14	1.9170	8 37 49.4	10.056
5	12 44 8.25	1.9200	8 47 51.9	10.027
6	12 46 3.54	1.9231	8 57 52.6	9.997
7	12 47 59.02	1.9262	9 7 51.5	9.966
8	12 49 54.69	1.9294	9 17 48.5	9.935
9	12 51 50.55	1.9326	9 27 43.7	9.903
10	12 53 46.60	1.9359	9 37 36.9	9.870
11	12 55 42.86	1.9393	9 47 28.1	9.837
12	12 57 39.32	1.9427	9 57 17.3	9.803
13	12 59 35.99	1.9462	10 7 4.4	9.768
14	13 1 32.87	1.9497	10 16 49.4	9.733
15	13 3 29.95	1.9532	10 26 32.3	9.697
16	13 5 27.25	1.9568	10 36 13.0	9.659
17	13 7 24.77	1.9605	10 45 51.4	9.621
18	13 9 22.51	1.9643	10 55 27.5	9.582
19	13 11 20.48	1.9681	11 5 1.3	9.543
20	13 13 18.68	1.9718	11 14 32.7	9.503
21	13 15 17.10	1.9757	11 24 1.7	9.462
22	13 17 15.76	1.9797	11 33 28.2	9.420
23	13 19 14.66	1.9836	11 42 52.1	9.378
24	13 21 13.79	1.9876	S. 11 52 13.5	9.335

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 21 13.79	1.9876	S.11 52 13.5	9.335
1	13 23 13.17	1.9917	12 1 32.3	9.291
2	13 25 12.79	1.9958	12 10 48.4	9.246
3	13 27 12.66	1.9999	12 20 1.8	9.200
4	13 29 12.78	2.0041	12 29 12.4	9.153
5	13 31 13.15	2.0083	12 38 20.2	9.106
6	13 33 13 78	2.0127	12 47 25.1	9.057
7	13 35 14.67	2.0170	12 56 27.1	9.008
8	13 37 15.82	2.0213	13 5 26.1	8.959
9	13 39 17.23	2.0257	13 14 22.2	8.909
10	13 41 18.91	2.0302	13 23 15.2	8.857
11	13 43 20.86	2.0347	13 32 5.0	8.804
12	13 45 23.08	2.0392	13 40 51.7	8.751
13	13 47 25.57	2.0438	13 49 35.2	8.697
14	13 49 28.34	2.0485	13 58 15.4	8.642
15	13 51 31.39	2.0532	14 6 52.2	8.585
16	13 53 34.72	2.0578	14 15 25.6	8.529
17	13 55 38.33	2.0625	14 23 55.7	8.472
18	13 57 42.22	2.0673	14 32 22.3	8.413
19	13 59 46.40	2.0721	14 40 45.3	8.353
20	14 1 50.87	2.0770	14 49 4.7	8.293
21	14 3 55.64	2.0819	14 57 20.5	8.232
22	14 6 0.70	2.0868	15 5 32.6	8.170
23	14 8 6.05	2.0917	S.15 13 40.9	8.106

MONDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 10 11.70	2.0967	S.15 21 45.3	8.042
1	14 12 17.65	2.1017	15 29 45.9	7.978
2	14 14 23.90	2.1067	15 37 42.6	7.912
3	14 16 30.45	2.1117	15 45 35.3	7.844
4	14 18 37.30	2.1167	15 53 23.9	7.776
5	14 20 44.46	2.1218	16 1 8.4	7.707
6	14 22 51.92	2.1269	16 8 48.8	7.638
7	14 24 59.69	2.1321	16 16 25.0	7.567
8	14 27 7.77	2.1372	16 23 56.8	7 494
9	14 29 16.16	2.1424	16 31 24.3	7.421
10	14 31 24.86	2.1477	16 38 47.4	7.348
11	14 33 33.88	2.1529	16 46 6.1	7.274
12	14 35 43.21	2.1581	16 53 20.3	7.198
13	14 37 52.85	2.1634	17 0 29.9	7.121
14	14 40 2.81	2.1687	17 7 34.8	7.044
15	14 42 13.09	2.1740	17 14 35.1	6.966
16	14 44 23.69	2.1792	17 21 30.7	6.886
17	14 46 34.60	2.1845	17 28 21.4	6.804
18	14 48 45.83	2.1898	17 35 7.2	6.722
19	14 50 57.38	2.1952	17 41 48.1	6.640
20	14 53 9.25	2.2005	17 48 24.0	6.557
21	14 55 21.44	2.2058	17 54 54.9	6.472
22	14 57 33.95	2.2112	18 1 20.7	6.386
23	14 59 46.78	2.2165	18 7 41.2	6.299
24	15 1 59.93	2.2218	S.18 13 56.5	6.211

TUESDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 1 59.93	2.2218	S.18 13 56.5	6.211
1	15 4 13.40	2.2272	18 20 6.5	6.122
2	15 6 27.19	2.2325	18 26 11.2	6.033
3	15 8 41.30	2.2378	18 32 10.5	5.942
4	15 10 55.73	2.2431	18 38 4.3	5.850
5	15 13 10.47	2.2484	18 43 52.5	5.757
6	15 15 25.54	2.2538	18 49 35.1	5.663
7	15 17 40.93	2.2591	18 55 12.1	5.569
8	15 19 56.63	2.2643	19 0 43.4	5.473
9	15 22 12.65	2.2696	19 6 8.8	5.375
10	15 24 28.98	2.2748	19 11 28.4	5.277
11	15 26 45.63	2.2801	19 16 42.1	5.178
12	15 29 2.59	2.2852	19 21 49.8	5.078
13	15 31 19.86	2.2904	19 26 51.5	4.977
14	15 33 37.44	2.2956	19 31 47.1	4.876
15	15 35 55.34	2.3008	19 36 36.6	4.773
16	15 38 13.54	2.3059	19 41 19.9	4.669
17	15 40 32.05	2.3110	19 45 56.9	4.564
18	15 42 50.86	2.3160	19 50 27.6	4.458
19	15 45 9.97	2.3210	19 54 51.9	4.352
20	15 47 29.38	2.3261	19 59 9.8	4.243
21	15 49 49.10	2.3311	20 3 21.1	4.134
22	15 52 9.11	2.3359	20 7 25.9	4.025
23	15 54 29.41	2.3408	S.20 11 24.1	3.915

WEDNESDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	15 56 50.01	2.3457	S.20 15 15.7	3.804
1	15 59 10.89	2.3504	20 19 0.6	3.692
2	16 1 32.06	2.3552	20 22 38.7	3.578
3	16 3 53.52	2.3600	20 26 9.9	3.463
4	16 6 15.26	2.3646	20 29 34.2	3.348
5	16 8 37.27	2.3692	20 32 51.6	3.232
6	16 10 59.56	2.3737	20 36 2.0	3.115
7	16 13 22.12	2.3782	20 39 5.4	2.997
8	16 15 44.95	2.3827	20 42 1.7	2.878
9	16 18 8.05	2.3872	20 44 50.8	2.758
10	16 20 31.41	2.3915	20 47 32.7	2.638
11	16 22 55.03	2.3957	20 50 7.4	2.517
12	16 25 18.90	2.3999	20 52 34.8	2.395
13	16 27 43.02	2.4041	20 54 54.8	2.272
14	16 30 7.39	2.4082	20 57 7.4	2.149
15	16 32 32.01	2.4122	20 59 12.7	2.026
16	16 34 56.86	2.4162	21 1 10.5	1.900
17	16 37 21.95	2.4201	21 3 0.7	1.774
18	16 39 47.27	2.4239	21 4 43.4	1.648
19	16 42 12.82	2.4277	21 6 18.5	1.521
20	16 44 38.59	2.4313	21 7 45.9	1.393
21	16 47 4.58	2.4349	21 9 5.6	1.264
22	16 49 30.78	2.4384	21 10 17.6	1.135
23	16 51 57.19	2.4419	21 11 21.8	1.006
24	16 54 23.81	2.4453	S.21 12 18.3	0.876

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	THURSDAY 29.					FRIDAY 30.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 54 23.81	2.4453	S. 21 12 18.3	0.876	0	17 53 50.51	2.4997	S. 20 54 36.4	2.382
1	16 56 50.63	2.4486	21 13 6.9	0.744	1	17 56 20.52	2.5007	20 52 9.3	2.520
2	16 59 17.64	2.4518	21 13 47.6	0.612	2	17 58 50.60	2.5017	20 49 34.0	2.658
3	17 1 44.84	2.4549	21 14 20.4	0.480	3	18 1 20.73	2.5026	20 46 50.4	2.796
4	17 4 12.23	2.4579	21 14 45.2	0.348	4	18 3 50.91	2.5034	20 43 58.5	2.934
5	17 6 39.79	2.4608	21 15 2.1	0.215	5	18 6 21.14	2.5042	20 40 58.3	3.072
6	17 9 7.53	2.4637	21 15 11.0	− 0.081	6	18 8 51.41	2.5048	20 37 49.8	3.211
7	17 11 35.44	2.4665	21 15 11.8	+ 0.053	7	18 11 21.71	2.5053	20 34 33.0	3.349
8	17 14 3.51	2.4693	21 15 4.6	0.187	8	18 13 52.04	2.5057	20 31 7.9	3.487
9	17 16 31.75	2.4719	21 14 49.3	0.322	9	18 16 22.39	2.5060	20 27 34.6	3.624
10	17 19 0.14	2.4743	21 14 25.9	0.457	10	18 18 52.76	2.5063	20 23 53.0	3.762
11	17 21 28.67	2.4767	21 13 54.4	0.593	11	18 21 23.14	2.5064	20 20 3.2	3.899
12	17 23 57.34	2.4790	21 13 14.7	0.730	12	18 23 53.53	2.5064	20 16 5.1	4.036
13	17 26 26.15	2.4813	21 12 26.8	0.866	13	18 26 23.91	2.5063	20 11 58.8	4.172
14	17 28 55.10	2.4835	21 11 30.7	1.002	14	18 28 54.29	2.5062	20 7 44.4	4.308
15	17 31 24.17	2.4855	21 10 26.5	1.139	15	18 31 24.66	2.5060	20 3 21.8	4.445
16	17 33 53.36	2.4874	21 9 14.0	1.277	16	18 33 55.01	2.5056	19 58 51.0	4.581
17	17 36 22.66	2.4892	21 7 53.3	1.414	17	18 36 25.33	2.5052	19 54 12.1	4.716
18	17 38 52.07	2.4910	21 6 24.3	1.552	18	18 38 55.63	2.5047	19 49 25.1	4.851
19	17 41 21.58	2.4927	21 4 47.0	1.690	19	18 41 25.90	2.5041	19 44 30.0	4.985
20	17 43 51.19	2.4943	21 3 1.5	1.828	20	18 43 56.13	2.5034	19 39 26.9	5.119
21	17 46 20.90	2.4958	21 1 7.7	1.966	21	18 46 26.31	2.5027	19 34 15.7	5.252
22	17 48 50.69	2.4972	20 59 5.6	2.104	22	18 48 56.45	2.5018	19 28 56.6	5.385
23	17 51 20.56	2.4985	20 56 55.2	2.243	23	18 51 26.53	2.5008	19 23 29.5	5.517
24	17 53 50.51	2.4997	S. 20 54 36.4	2.382	24	18 53 56.55	2.4998	S. 19 17 54.5	5.649

PHASES OF THE MOON.

	d	h	m
○ Full Moon	1	8	33.4
☾ Last Quarter	8	5	10.1
● New Moon	15	6	33.4
☽ First Quarter	23	6	1.1
○ Full Moon	30	18	8.6

	d	h
☾ Perigee	6	18.8
☾ Apogee	21	15.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Regulus	W.	98° 11′ 22″	2540	99° 51′ 39″	2528	101° 32′ 13″	2517	103° 13′ 2″	2506
	Spica	W.	44 15 23	2520	45 56 9	2508	47 37 11	2496	49 18 30	2485
	α Aquilæ	E.	58 35 52	3124	57 8 11	3135	55 40 44	3149	54 13 34	3167
	Fomalhaut	E.	86 19 8	2998	84 48 53	2989	83 18 27	2981	81 47 51	2974
	α Pegasi	E.	104 20 57	2666	102 43 32	2653	101 5 49	2640	99 27 49	2628
2	Spica	W.	57 48 58	2431	59 31 48	2422	61 14 51	2412	62 58 8	2403
	α Aquilæ	E.	47 4 21	3311	45 40 22	3355	44 17 14	3405	42 55 3	3463
	Fomalhaut	E.	74 13 4	2956	72 41 56	2956	71 10 48	2958	69 39 42	2961
	α Pegasi	E.	91 13 41	2572	89 34 7	2562	87 54 20	2553	86 14 20	2544
3	Spica	W.	71 37 41	2362	73 22 11	2355	75 6 51	2348	76 51 41	2341
	Antares	W.	26 36 56	2449	28 19 21	2433	30 2 8	2419	31 45 16	2405
	Fomalhaut	E.	62 5 56	3004	60 35 48	3019	59 5 59	3037	57 36 32	3058
	α Pegasi	E.	77 51 36	2510	76 10 37	2504	74 29 30	2500	72 48 17	2497
4	Spica	W.	85 38 8	2313	87 23 49	2307	89 9 38	2303	90 55 33	2299
	Antares	W.	40 25 12	2355	42 9 52	2347	43 54 43	2340	45 39 44	2333
	Fomalhaut	E.	50 17 2	3216	48 51 12	3261	47 26 15	3313	46 2 19	3372
	α Pegasi	E.	64 21 15	2489	62 39 47	2490	60 58 20	2492	59 16 55	2494
	α Arietis	E.	107 17 18	2355	105 32 39	2350	103 47 52	2345	102 2 58	2340
5	Spica	W.	99 46 31	2283	101 32 56	2280	103 19 25	2278	105 5 57	2276
	Antares	W.	54 26 55	2309	56 12 41	2306	57 58 32	2303	59 44 27	2300
	Fomalhaut	E.	39 22 16	3804	38 7 18	3929	36 54 28	4073	35 44 0	4238
	α Pegasi	E.	50 51 26	2527	49 10 51	2539	47 30 32	2552	45 50 31	2567
	α Arietis	E.	93 16 56	2322	91 31 29	2320	89 45 58	2317	88 0 24	2316
	Sun	E.	132 38 8	2585	130 58 52	2583	129 19 33	2580	127 40 11	2578
6	Spica	W.	113 59 11	2270	115 45 54	2270	117 32 38	2270	119 19 22	2269
	Antares	W.	68 34 59	2290	70 21 13	2289	72 7 28	2289	73 53 44	2289
	α Arietis	E.	79 12 5	2311	77 26 22	2312	75 40 40	2312	73 54 58	2313
	Sun	E.	119 22 43	2572	117 43 9	2571	116 3 34	2571	114 23 59	2571
7	Antares	W.	82 45 5	2290	84 31 19	2291	86 17 32	2292	88 3 43	2293
	α Aquilæ	W.	37 22 7	3610	38 40 30	3510	40 0 43	3423	41 22 34	3345
	α Arietis	E.	65 6 54	2321	63 21 25	2324	61 36 0	2327	59 50 40	2330
	Sun	E.	106 6 8	2573	104 26 36	2574	102 47 6	2576	101 7 38	2577
8	Antares	W.	96 54 6	2302	98 40 2	2305	100 25 54	2308	102 11 42	2311
	α Aquilæ	W.	48 31 13	3071	49 59 58	3034	51 29 29	3000	52 59 42	2969
	α Arietis	E.	51 5 21	2353	49 20 39	2359	47 36 5	2366	45 51 41	2373
	Sun	E.	92 50 53	2587	91 11 40	2590	89 32 31	2593	87 53 26	2595
9	α Aquilæ	W.	60 38 59	2863	62 12 5	2848	63 45 30	2835	65 19 12	2825
	Fomalhaut	W.	36 39 55	3984	37 51 50	3856	39 5 54	3746	40 21 53	3647
	α Arietis	E.	37 12 41	2423	35 29 39	2437	33 46 57	2453	32 4 37	2471
	Sun	E.	79 38 59	2611	78 0 19	2615	76 21 44	2618	74 43 14	2622
10	α Aquilæ	W.	73 10 39	2791	74 45 19	2787	76 20 4	2785	77 54 52	2784
	Fomalhaut	W.	47 4 40	3304	48 28 47	3257	49 53 49	3214	51 19 41	3178
	α Pegasi	W.	25 49 47	3158	27 16 47	3069	28 45 34	2997	30 15 51	2936

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Regulus	W.	104° 54′ 7″	2495	106° 35′ 27″	2485	108° 17′ 1″	2475	109° 58′ 49″	2465
	Spica	W.	51 0 5	2473	52 41 56	2462	54 24 2	2452	56 6 23	2442
	α Aquilæ	E.	52 46 45	3188	51 20 21	3212	49 54 26	3240	48 29 4	3273
	Fomalhaut	E.	80 17 6	2968	78 46 13	2963	77 15 14	2960	75 44 11	2957
	α Pegasi	E.	97 49 32	2615	96 10 58	2603	94 32 7	2592	92 53 1	2582
2	Spica	W.	64 41 38	2394	66 25 21	2386	68 9 16	2378	69 53 23	2370
	α Aquilæ	E.	41 33 57	3529	40 14 5	3606	38 55 37	3694	37 38 44	3797
	Fomalhaut	E.	68 8 40	2965	66 37 44	2973	65 6 57	2981	63 36 20	2991
	α Pegasi	E.	84 34 8	2535	82 53 44	2528	81 13 10	2522	79 32 27	2516
3	Spica	W.	78 36 41	2335	80 21 50	2328	82 7 8	2323	83 52 34	2317
	Antares	W.	33 28 43	2393	35 12 28	2382	36 56 29	2372	38 40 44	2363
	Fomalhaut	E.	56 7 31	3082	54 38 59	3110	53 11 1	3140	51 43 40	3176
	α Pegasi	E.	71 6 59	2494	69 25 37	2492	67 44 12	2489	66 2 44	2489
4	Spica	W.	92 41 34	2295	94 27 41	2291	96 13 53	2288	98 0 10	2285
	Antares	W.	47 24 55	2328	49 10 14	2322	50 55 41	2317	52 41 15	2313
	Fomalhaut	E.	44 39 30	3438	43 17 56	3513	41 57 46	3596	40 39 9	3694
	α Pegasi	E.	57 35 34	2499	55 54 19	2504	54 13 12	2511	52 32 14	2518
	α Arietis	E.	100 17 57	2336	98 32 50	2332	96 47 37	2328	95 2 19	2325
5	Spica	W.	106 52 32	2274	108 39 9	2273	110 25 48	2272	112 12 29	2271
	Antares	W.	61 30 27	2297	63 16 31	2295	65 2 38	2294	66 48 47	2291
	Fomalhaut	E.	34 36 10	4429	33 31 15	4649	32 29 32	4905	31 31 21	5206
	α Pegasi	E.	44 10 51	2585	42 31 35	2605	40 52 47	2629	39 14 31	2656
	α Arietis	E.	86 14 48	2315	84 29 10	2313	82 43 30	2312	80 57 48	2311
	Sun	E.	126 0 46	2576	124 21 18	2574	122 41 48	2573	121 2 16	2572
6	Spica	W.	121 6 7	2270	122 52 51	2270	124 39 35	2270	126 26 18	2272
	Antares	W.	75 40 0	2288	77 26 17	2288	79 12 34	2289	80 58 50	2289
	α Arietis	E.	72 9 17	2314	70 23 38	2315	68 38 1	2317	66 52 26	2319
	Sun	E.	112 44 24	2571	111 4 49	2572	109 25 15	2572	107 45 41	2572
7	Antares	W.	89 49 53	2295	91 36 0	2296	93 22 5	2298	95 8 7	2300
	α Aquilæ	W.	42 45 54	3276	44 10 34	3215	45 36 25	3162	47 3 20	3114
	α Arietis	E.	58 5 24	2333	56 20 13	2337	54 35 8	2343	52 50 11	2348
	Sun	E.	99 28 12	2579	97 48 48	2581	96 9 27	2583	94 30 9	2585
8	Antares	W.	103 57 26	2313	105 43 6	2317	107 28 41	2320	109 14 11	2324
	α Aquilæ	W.	54 30 33	2943	56 1 57	2919	57 33 52	2898	59 6 14	2880
	α Arietis	E.	44 7 27	2381	42 23 25	2390	40 39 36	2400	38 56 1	2410
	Sun	E.	86 14 24	2598	84 35 26	2601	82 56 33	2604	81 17 44	2607
9	α Aquilæ	W.	66 53 8	2815	68 27 17	2807	70 1 36	2800	71 36 4	2795
	Fomalhaut	W.	41 39 37	3560	42 58 55	3484	44 19 37	3416	45 41 35	3358
	α Arietis	E.	30 22 43	2492	28 41 18	2516	27 0 27	2545	25 20 16	2579
	Sun	E.	73 4 49	2626	71 26 30	2630	69 48 16	2635	68 10 8	2639
10	α Aquilæ	W.	79 29 41	2783	81 4 31	2784	82 39 20	2786	84 14 6	2789
	Fomalhaut	W.	52 46 17	3144	54 13 33	3115	55 41 24	3089	57 9 47	3066
	α Pegasi	W.	31 47 24	2886	33 20 1	2843	34 53 33	2808	36 27 51	2778

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	Sun	E.	66° 32′ 6″	2644	64° 54′ 11″	2649	63° 16′ 22″	2654	61° 38′ 40″	2658
11	α Aquilæ	W.	85 48 48	2792	87 23 26	2796	88 57 59	2801	90 32 25	2808
	Fomalhaut	W.	58 38 38	3047	60 7 53	3029	61 37 30	3013	63 7 27	2999
	α Pegasi	W.	38 2 48	2753	39 38 18	2731	41 14 17	2713	42 50 39	2698
	Sun	E.	53 31 53	2687	51 54 55	2692	50 18 5	2698	48 41 23	2705
12	Fomalhaut	W.	70 40 34	2960	72 11 37	2956	73 42 45	2954	75 13 55	2953
	α Pegasi	W.	50 56 29	2665	52 34 9	2652	54 11 53	2649	55 49 41	2648
	Sun	E.	40 40 10	2741	39 4 24	2749	37 28 49	2756	35 53 24	2766
13	Fomalhaut	W.	82 49 39	2964	84 20 37	2969	85 51 28	2976	87 22 11	2983
	α Pegasi	W.	63 58 43	2655	65 36 23	2658	67 13 59	2663	68 51 29	2667
	Sun	E.	27 59 15	2812	26 25 3	2822	24 51 4	2834	23 17 20	2845
17	Sun	W.	20 47 6	3175	22 13 45	3185	23 40 12	3195	25 6 27	3204
	Mars	E.	35 58 58	3100	34 30 48	3118	33 3 0	3137	31 35 35	3157
	Regulus	E.	41 48 38	2860	40 15 28	2873	38 42 35	2888	37 10 1	2904
	Spica	E.	95 28 38	2810	93 54 23	2821	92 20 23	2832	90 46 37	2844
18	Sun	W.	32 14 44	3256	33 39 47	3266	35 4 33	3276	36 29 17	3287
	Regulus	E.	29 32 16	2989	28 1 49	3009	26 31 48	3031	25 2 14	3055
	Spica	E.	83 1 18	2896	81 28 54	2907	79 56 44	2916	78 24 46	2927
19	Sun	W.	43 29 40	3334	44 53 12	3343	46 16 34	3351	47 39 47	3359
	Pollux	W.	22 51 29	3509	24 11 43	3458	25 32 54	3416	26 54 52	3381
	Spica	E.	70 47 57	2971	69 17 8	2980	67 46 30	2989	66 16 3	2997
	Antares	E.	116 11 6	2993	114 40 45	3001	113 10 34	3009	111 40 33	3017
20	Sun	W.	54 33 36	3394	55 55 59	3401	57 18 14	3408	58 40 22	3413
	Pollux	W.	33 52 38	3279	35 17 14	3266	36 42 5	3256	38 7 8	3247
	Venus	W.	25 10 33	3625	26 28 40	3620	27 46 53	3615	29 5 11	3612
	Spica	E.	58 46 4	3030	57 16 29	3035	55 47 0	3041	54 17 38	3046
	Antares	E.	104 12 36	3049	102 43 24	3054	101 14 18	3060	99 45 19	3065
21	Sun	W.	65 29 44	3432	66 51 24	3435	68 13 1	3438	69 34 35	3439
	Pollux	W.	45 14 34	3216	46 40 24	3211	48 6 20	3207	49 32 21	3203
	Venus	W.	35 37 23	3602	36 55 55	3600	38 14 29	3598	39 33 5	3598
	Spica	E.	46 52 13	3065	45 23 21	3068	43 54 32	3069	42 25 45	3072
	Antares	E.	92 21 43	3082	90 53 12	3085	89 24 44	3087	87 56 19	3089
22	Sun	W.	76 22 8	3440	77 43 39	3439	79 5 11	3438	80 26 45	3435
	Pollux	W.	56 43 42	3181	58 10 14	3177	59 36 51	3172	61 3 34	3166
	Venus	W.	46 6 33	3585	47 25 24	3582	48 44 18	3579	50 3 15	3576
	Mars	W.	22 54 46	3471	24 15 43	3450	25 37 3	3433	26 58 42	3417
	Regulus	W.	19 45 29	3253	21 10 36	3228	22 36 12	3208	24 2 12	3190
	Spica	E.	35 2 15	3073	33 33 33	3073	32 4 50	3071	30 36 5	3069
	Antares	E.	80 34 33	3091	79 6 12	3090	77 37 50	3088	76 9 26	3087
23	Sun	W.	87 15 27	3415	88 37 26	3410	89 59 31	3405	91 21 42	3399
	Pollux	W.	68 18 48	3137	69 46 13	3131	71 13 45	3124	72 41 25	3117
	Venus	W.	56 39 14	3549	57 58 44	3542	59 18 22	3535	60 38 7	3528
	Mars	W.	33 50 55	3356	35 14 2	3345	36 37 22	3333	38 0 55	3323

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Sun	E.	60 1 4	2663	58 23 35	2669	56 46 14	2675	55 9 0	2680
11	α Aquilæ	W.	92 6 43	2815	93 40 52	2823	95 14 51	2831	96 48 39	2840
	Fomalhaut	W.	64 37 41	2988	66 8 9	2979	67 38 48	2971	69 9 37	2965
	α Pegasi	W.	44 27 21	2686	46 4 20	2676	47 41 32	2667	49 18 56	2660
	Sun	E.	47 4 50	2712	45 28 26	2719	43 52 11	2726	42 16 6	2733
12	Fomalhaut	W.	76 45 7	2953	78 16 19	2954	79 47 29	2957	81 18 36	2960
	α Pegasi	W.	57 27 31	2648	59 5 21	2648	60 43 11	2649	62 20 59	2652
	Sun	E.	34 18 11	2774	32 43 9	2783	31 8 19	2792	29 33 41	2801
13	Fomalhaut	W.	88 52 45	2991	90 23 9	3001	91 53 21	3010	93 23 21	3021
	α Pegasi	W.	70 28 53	2673	72 6 9	2679	73 43 17	2685	75 20 17	2692
	Sun	E.	21 43 51	2858	20 10 38	2872	18 37 43	2887	17 5 7	2903
17	Sun	W.	26 32 31	3214	27 58 23	3225	29 24 2	3236	30 49 29	3246
	Mars	E.	30 8 34	3178	28 41 59	3201	27 15 51	3225	25 50 12	3252
	Regulus	E.	35 37 47	2920	34 5 53	2935	32 34 19	2952	31 3 6	2970
	Spica	E.	89 13 6	2855	87 39 49	2865	86 6 45	2876	84 33 55	2886
18	Sun	W.	37 53 44	3296	39 18 0	3306	40 42 4	3316	42 5 57	3325
	Regulus	E.	23 33 9	3081	22 4 36	3110	20 36 39	3145	19 9 24	3186
	Spica	E.	76 53 1	2936	75 21 28	2945	73 50 6	2954	72 18 56	2963
19	Sun	W.	49 2 50	3367	50 25 44	3375	51 48 29	3382	53 11 6	3388
	Pollux	W.	28 17 30	3352	29 40 41	3329	31 4 19	3310	32 28 19	3294
	Spica	E.	64 45 46	3004	63 15 38	3010	61 45 38	3018	60 15 47	3024
	Antares	E.	110 10 41	3023	108 40 57	3030	107 11 22	3037	105 41 55	3043
20	Sun	W.	60 2 24	3417	61 24 21	3422	62 46 13	3425	64 8 1	3430
	Pollux	W.	39 32 21	3240	40 57 43	3233	42 23 13	3227	43 48 50	3221
	Venus	W.	30 23 32	3610	31 41 56	3607	33 0 23	3605	34 18 52	3603
	Spica	E.	52 48 22	3051	51 19 12	3056	49 50 8	3059	48 21 8	3063
	Antares	E.	98 16 26	3069	96 47 38	3073	95 18 55	3077	93 50 17	3080
21	Sun	W.	70 56 7	3440	72 17 38	3441	73 39 8	3441	75 0 38	3441
	Pollux	W.	50 58 27	3198	52 24 38	3194	53 50 54	3190	55 17 15	3185
	Venus	W.	40 51 42	3596	42 10 21	3594	43 29 2	3591	44 47 46	3588
	Spica	E.	40 57 1	3073	39 28 19	3074	37 59 38	3074	36 30 57	3073
	Antares	E.	86 27 56	3091	84 59 35	3091	83 31 14	3091	82 2 54	3091
22	Sun	W.	81 48 22	3432	83 10 2	3429	84 31 46	3425	85 53 34	3421
	Pollux	W.	62 30 24	3161	63 57 20	3156	65 24 22	3150	66 51 31	3143
	Venus	W.	51 22 16	3571	52 41 22	3565	54 0 34	3561	55 19 51	3555
	Mars	W.	28 20 39	3403	29 42 52	3391	31 5 19	3379	32 28 0	3366
	Regulus	W.	25 28 33	3175	26 55 12	3161	28 22 8	3148	29 49 19	3137
	Spica	E.	29 7 18	3067	27 38 28	3065	26 9 35	3061	24 40 38	3058
	Antares	E.	74 41 0	3084	73 12 31	3081	71 43 58	3078	70 15 22	3074
23	Sun	W.	92 44 0	3392	94 6 26	3384	95 29 1	3376	96 51 45	3367
	Pollux	W.	74 9 14	3109	75 37 13	3101	77 5 22	3092	78 33 41	3084
	Venus	W.	61 58 0	3520	63 18 2	3512	64 38 13	3503	65 58 34	3493
	Mars	W.	39 24 40	3312	40 48 38	3300	42 12 49	3290	43 37 12	3278

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
23	Regulus	W.	31° 16′ 44″	3125	32° 44′ 23″	3114	34° 12′ 15″	3104	35° 40′ 20″	3093
	Spica	E.	23 11 37	3054	21 42 31	3050	20 13 20	3045	18 44 3	3040
	Antares	E.	68 46 41	3070	67 17 55	3066	65 49 4	3061	64 20 7	3056
24	Sun	W.	98 14 39	3358	99 37 43	3350	101 0 57	3339	102 24 23	3330
	Pollux	W.	80 2 10	3075	81 30 50	3065	82 59 42	3056	84 28 46	3045
	Venus	W.	67 19 6	3484	68 39 48	3473	70 0 42	3463	71 21 48	3452
	Mars	W.	45 1 49	3266	46 26 40	3255	47 51 44	3244	49 17 1	3232
	Regulus	W.	43 4 0	3039	44 33 24	3029	46 3 1	3018	47 32 52	3006
	Antares	E.	56 53 30	3022	55 23 45	3015	53 53 51	3007	52 23 47	2999
	α Aquilæ	E.	108 29 33	3461	107 8 25	3445	105 46 59	3429	104 25 15	3413
25	Sun	W.	109 24 39	3971	110 49 24	3959	112 14 24	3946	113 39 39	3932
	Pollux	W.	91 57 18	2991	93 27 42	2980	94 58 20	2968	96 29 13	2955
	Venus	W.	78 10 31	3391	79 32 58	3377	80 55 41	3363	82 18 40	3350
	Mars	W.	56 27 10	3167	57 53 59	3153	59 21 4	3139	60 48 26	3125
	Regulus	W.	55 5 48	2945	56 37 10	2932	58 8 48	2919	59 40 43	2905
	Antares	E.	44 50 43	2953	43 19 31	2943	41 48 7	2934	40 16 31	2924
	α Aquilæ	E.	97 32 14	3338	96 8 46	3324	94 45 2	3310	93 21 2	3295
26	Sun	W.	120 50 2	3160	122 16 59	3144	123 44 15	3129	125 11 49	3114
	Pollux	W.	104 7 36	2891	105 40 6	2879	107 12 52	2866	108 45 55	2852
	Venus	W.	89 17 44	3974	90 42 26	3958	92 7 27	3942	93 32 47	3925
	Mars	W.	68 9 44	3049	69 38 56	3034	71 8 27	3018	72 38 18	3001
	Regulus	W.	67 24 47	2833	68 58 32	2818	70 32 36	2803	72 7 0	2788
	Antares	E.	32 35 26	2877	31 2 38	2869	29 29 40	2862	27 56 33	2857
	α Aquilæ	E.	86 17 1	3229	84 51 26	3217	83 25 37	3205	81 59 34	3193
27	Sun	W.	132 34 31	3033	134 4 3	3016	135 33 56	3000	137 4 9	2983
	Venus	W.	100 44 22	3141	102 11 42	3124	103 39 22	3107	105 7 23	3090
	Mars	W.	80 12 38	2919	81 44 33	2902	83 16 49	2885	84 49 27	2868
	Regulus	W.	80 4 4	2708	81 40 33	2692	83 17 22	2677	84 54 33	2660
	Spica	W.	26 3 29	2691	27 40 21	2675	29 17 35	2658	30 55 11	2642
	α Aquilæ	E.	74 46 3	3143	73 18 46	3135	71 51 19	3129	70 23 44	3122
28	Regulus	W.	93 5 57	2580	94 45 20	2564	96 25 5	2548	98 5 12	2532
	Mars	W.	92 38 6	2784	94 12 55	2766	95 48 7	2750	97 23 41	2734
	Spica	W.	39 8 43	2560	40 48 33	2544	42 28 45	2528	44 9 19	2512
	α Aquilæ	E.	63 4 18	3107	61 36 17	3110	60 8 19	3113	58 40 25	3119
	Fomalhaut	E.	90 55 11	3033	89 25 39	3017	87 55 47	3002	86 25 37	2988
	α Pegasi	E.	109 16 38	2718	107 40 22	2698	106 3 40	2680	104 26 33	2662
29	Regulus	W.	106 31 11	2456	108 13 26	2441	109 56 2	2427	111 38 58	2414
	Mars	W.	105 26 52	2655	107 4 33	2639	108 42 35	2624	110 20 57	2610
	Spica	W.	52 37 43	2434	54 20 29	2419	56 3 37	2404	57 47 6	2390
	α Aquilæ	E.	51 23 35	3186	49 57 9	3210	48 31 12	3239	47 5 49	3274
	Fomalhaut	E.	78 50 41	2931	77 19 1	2923	75 47 11	2916	74 15 12	2909
	α Pegasi	E.	96 15 2	2577	94 35 36	2561	92 55 48	2546	91 15 39	2532
30	Spica	W.	66 29 32	2322	68 14 59	2309	70 0 45	2298	71 46 48	2286
	Antares	W.	21 36 34	2455	23 18 51	2424	25 1 52	2398	26 45 30	2374
	Fomalhaut	E.	66 34 6	2905	65 1 53	2909	63 29 46	2916	61 57 47	2925
	α Pegasi	E.	82 50 7	2467	81 8 8	2456	79 25 53	2446	77 43 24	2436

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Regulus	W.	37° 8′ 38″	3082	38° 37′ 9″	3072	40° . 5′ 53″	3061	41° 34′ 50″	3051
	Spica	E.	17 14 40	3035	15 45 11	3030	14 15 35	3026	12 45 54	3022
	Antares	E.	62 51 3	3050	61 21 52	3043	59 52 33	3037	58 23 6	3030
24	Sun	W.	103 48 0	3319	105 11 50	3307	106 35 53	3296	108 0 9	3284
	Pollux	W.	85 58 3	3035	87 27 32	3025	88 57 14	3014	90 27 9	3003
	Venus	W.	72 43 6	3440	74 4 37	3429	75 26 21	3416	76 48 19	3404
	Mars	W.	50 42 32	2220	52 8 18	3206	53 34 20	3193	55 0 37	3180
	Regulus	W.	49 2 57	2994	50 33 17	2982	52 3 52	2970	53 34 42	2958
	Antares	E.	50 53 33	2990	49 23 8	2981	47 52 31	2972	46 21 43	2962
	α Aquilæ	E.	103 3 13	3398	101 40 54	3383	100 18 18	3368	98 55 25	3352
25	Sun	W.	115 5 10	3218	116 30 58	3204	117 57 2	3190	119 23 23	3175
	Pollux	W.	98 0 22	2942	99 31 47	2931	101 3 27	2918	102 35 23	2905
	Venus	W.	83 41 54	3335	85 5 25	3319	86 29 14	3305	87 53 20	3289
	Mars	W.	62 16 5	3110	63 44 2	3095	65 12 18	3080	66 40 52	3065
	Regulus	W.	61 12 56	2891	62 45 27	2877	64 18 15	2862	65 51 22	2848
	Antares	E.	38 44 42	2914	37 12 41	2905	35 40 28	2895	34 8 3	2886
	α Aquilæ	E.	91 56 45	3282	90 32 12	3269	89 7 24	3255	87 42 20	3242
26	Sun	W.	126 39 42	3097	128 7 55	3082	129 36 27	3065	131 5 19	3049
	Pollux	W.	110 19 16	2838	111 52 54	2825	113 26 49	2812	115 1 1	2798
	Venus	W.	94 58 26	3209	96 24 25	3192	97 50 44	3175	99 17 23	3158
	Mars	W.	74 8 29	2985	75 39 0	2969	77 9 52	2953	78 41 4	2935
	Regulus	W.	73 41 43	2773	75 16 46	2756	76 52 11	2741	78 27 57	2725
	Antares	E.	26 23 19	2852	24 49 59	2850	23 16 36	2851	21 43 14	2855
	α Aquilæ	E.	80 33 17	3183	79 6 47	3172	77 40 4	3162	76 13 9	3153
27	Sun	W.	138 34 43	2967	140 5 37	2951	141 36 51	2935	143 8 26	2919
	Venus	W.	106 35 45	3073	108 4 28	3055	109 33 33	3038	111 2 59	3021
	Mars	W.	86 22 27	2851	87 55 49	2834	89 29 33	2817	91 3 39	2801
	Regulus	W.	86 32 6	2645	88 10 0	2628	89 48 17	2612	91 26 56	2596
	Spica	W.	32 33 9	2626	34 11 29	2610	35 50 11	2593	37 29 16	2577
	α Aquilæ	E.	68 56 1	3117	67 28 12	3112	66 0 17	3109	64 32 18	3108
28	Regulus	W.	99 45 41	2516	101 26 32	2501	103 7 44	2486	104 19 17	2471
	Mars	W.	98 59 36	2717	100 35 53	2701	102 12 31	2685	103 49 31	2669
	Spica	W.	45 50 16	2496	47 31 35	2480	49 13 16	2465	50 55 19	2450
	α Aquilæ	E.	57 12 38	3126	55 45 0	3136	54 17 34	3150	52 50 25	3166
	Fomalhaut	E.	84 55 9	2974	83 24 24	2962	81 53 24	2950	80 22 9	2940
	α Pegasi	E.	102 49 2	2644	101 11 7	2626	99 32 48	2610	97 54 6	2593
29	Regulus	W.	113 22 13	2400	115 5 48	2387	116 49 41	2374	118 33 53	2362
	Mars	W.	111 59 39	2596	113 38 40	2582	115 18 0	2569	116 57 38	2557
	Spica	W.	59 30 55	2375	61 15 5	2362	62 59 35	2348	64 44 24	2335
	α Aquilæ	E.	45 41 7	3314	44 17 12	3361	42 54 11	3415	41 32 12	3480
	Fomalhaut	E.	72 43 5	2905	71 10 53	2903	69 38 38	2902	68 6 22	2902
	α Pegasi	E.	89 35 10	2518	87 54 22	2504	86 13 15	2492	84 31 50	2479
30	Spica	W.	73 33 8	2275	75 19 44	2264	77 6 37	2253	78 53 45	2243
	Antares	W.	28 29 42	2353	30 14 24	2335	31 59 33	2317	33 45 7	2302
	Fomalhaut	E.	60 26 0	2937	58 54 28	2951	57 23 14	2969	55 52 22	2989
	α Pegasi	E.	76 0 41	2428	74 17 46	2419	72 34 39	2412	70 51 22	2405

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	6 41 17.39	10.336	N.23 6 49.0	−10.20	15 46.21	68.78	3 31.93	0.478
Sun.	2	6 45 25.35	10.326	23 2 32.3	11.21	15 46.20	68.74	3 43.30	0.468
Mon.	3	6 49 33.03	10.314	22 57 51.4	12.21	15 46.20	68.70	3 54.39	0.456
Tues.	4	6 53 40.42	10.302	22 52 46.4	−13.21	15 46.20	68.66	4 5.19	0.444
Wed.	5	6 57 47.52	10.289	22 47 17.5	14.20	15 46.21	68.62	4 15.71	0.431
Thur.	6	7 1 54.30	10.275	22 41 24.8	15.19	15 46.22	68.57	4 25.90	0.417
Frid.	7	7 6 0.74	10.261	22 35 8.4	−16.17	15 46.23	68.52	4 35.75	0.403
Sat.	8	7 10 6.83	10.246	22 28 28.5	17.14	15 46.25	68.47	4 45.25	0.388
Sun.	9	7 14 12.53	10.230	22 21 25.3	18.11	15 46.27	68.41	4 54.38	0.372
Mon.	10	7 18 17.84	10.213	22 13 58.8	−19.08	15 46.29	68.35	5 3.11	0.355
Tues.	11	7 22 22.73	10.195	22 6 9.2	20.03	15 46.32	68.29	5 11.42	0.337
Wed.	12	7 26 27.20	10.177	21 57 56.9	20.97	15 46.36	68.23	5 19.31	0.319
Thur.	13	7 30 31.22	10.158	21 49 22.0	−21.91	15 46.40	68.16	5 26.76	0.300
Frid.	14	7 34 34.77	10.138	21 40 24.7	22.84	15 46.44	68.09	5 33.73	0.280
Sat.	15	7 38 37.84	10.117	21 31 5.0	23.77	15 46.49	68.02	5 40.22	0.260
Sun.	16	7 42 40.40	10.097	21 21 23.5	−24.68	15 46.55	67.95	5 46.22	0.239
Mon.	17	7 46 42.47	10.075	21 11 20.2	25.58	15 46.62	67.87	5 51.71	0.217
Tues.	18	7 50 44.00	10.052	21 0 55.3	26.47	15 46.69	67.80	5 56.66	0.194
Wed.	19	7 54 44.97	10.028	20 50 9.0	−27.35	15 46.76	67.72	6 1.06	0.171
Thur.	20	7 58 45.38	10.004	20 39 1.8	28.23	15 46.84	67.64	6 4.90	0.147
Frid.	21	8 2 45.21	9.980	20 27 33.9	29.09	15 46.93	67.56	6 8.17	0.123
Sat.	22	8 6 44.46	9.956	20 15 45.5	−29.94	15 47.02	67.48	6 10.86	0.099
Sun.	23	8 10 43.11	9.931	20 3 36.7	30.78	15 47.11	67.40	6 12.96	0.074
Mon.	24	8 14 41.16	9.906	19 51 7.9	31.61	15 47.21	67.32	6 14.45	0.049
Tues.	25	8 18 38.61	9.881	19 38 19.3	−32.43	15 47.31	67.24	6 15.35	0.024
Wed.	26	8 22 35.46	9.856	19 25 11.1	33.23	15 47.41	67.16	6 15.64	0.001
Thur.	27	8 26 31.70	9.830	19 11 43.6	34.03	15 47.52	67.07	6 15.31	0.027
Frid.	28	8 30 27.33	9.805	18 57 57.2	−34.81	15 47.63	66.99	6 14.38	0.052
Sat.	29	8 34 22.34	9.779	18 43 52.1	35.59	15 47.75	66.90	6 12.85	0.078
Sun.	30	8 38 16.75	9.754	18 29 28.5	36.35	15 47.86	66.82	6 10.71	0.103
Mon.	31	8 42 10.55	9.729	18 14 46.6	37.11	15 47.98	66.73	6 7.96	0.128
Tues.	32	8 46 3.75	9.704	N.17 59 46.8	−37.86	15 48.10	66.65	6 4.61	0.153

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.19$ from the sidereal time.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	6 41 16.78	10.335	N. 23 6 49.6	−10.20	3 31.90	0.478	6 37 44.88
Sun.	2	6 45 24.71	10.325	23 2 33.0	11.21	3 43.27	0.468	6 41 41.44
Mon.	3	6 49 32.36	10.313	22 57 52.2	12.21	3 54.36	0.456	6 45 38.00
Tues.	4	6 53 39.72	10.301	22 52 47.3	−13.21	4 5.16	0.444	6 49 34.56
Wed.	5	6 57 46.79	10.288	22 47 18.5	14.20	4 15.68	0.431	6 53 31.11
Thur.	6	7 1 53.54	10.274	22 41 25.9	15.19	4 25.87	0.417	6 57 27.67
Frid.	7	7 5 59.95	10.260	22 35 9.6	−16.17	4 35.72	0.403	7 1 24.23
Sat.	8	7 10 6.01	10.245	22 28 29.8	17.14	4 45.22	0.388	7 5 20.79
Sun.	9	7 14 11.69	10.229	22 21 26.7	18.11	4 54.35	0.372	7 9 17.34
Mon.	10	7 18 16.98	10.212	22 14 0.3	−19.08	5 3.08	0.355	7 13 13.90
Tues.	11	7 22 21.85	10.194	22 6 10.9	20.03	5 11.39	0.337	7 17 10.46
Wed.	12	7 26 26.30	10.176	21 57 58.8	20.97	5 19.28	0.319	7 21 7.02
Thur.	13	7 30 30.30	10.157	21 49 23.9	−21.91	5 26.73	0.300	7 25 3.57
Frid.	14	7 34 33.83	10.137	21 40 26.7	22.84	5 33.70	0.280	7 29 0.13
Sat.	15	7 38 36.88	10.116	21 31 7.2	23.77	5 40.20	0.260	7 32 56.68
Sun.	16	7 42 39.44	10.096	21 21 25.8	−24.68	5 46.20	0.239	7 36 53.24
Mon.	17	7 46 41.48	10.074	21 11 22.6	25.58	5 51.69	0.217	7 40 49.79
Tues.	18	7 50 43.00	10.051	21 0 57.8	26.47	5 56.65	0.194	7 44 46.35
Wed.	19	7 54 43.96	10.028	20 50 11.7	−27.35	6 1.05	0.171	7 48 42.91
Thur.	20	7 58 44.36	10.004	20 39 4.7	28.23	6 4.89	0.147	7 52 39.47
Frid.	21	8 2 44.19	9.980	20 27 36.8	29.09	6 8.16	0.123	7 56 36.03
Sat.	22	8 6 43.43	9.956	20 15 48.5	−29.94	6 10.85	0.099	8 0 32.58
Sun.	23	8 10 42.08	9.931	20 3 39.8	30.78	6 12.95	0.074	8 4 29.13
Mon.	24	8 14 40.13	9.906	19 51 11.2	31.61	6 14.44	0.049	8 8 25.69
Tues.	25	8 18 37.58	9.881	19 38 22.7	−32.43	6 15.34	0.024	8 12 22.24
Wed.	26	8 22 34.43	9.856	19 25 14.6	33.23	6 15.63	0.001	8 16 18.80
Thur.	27	8 26 30.67	9.830	19 11 47.2	34.03	6 15.31	0.027	8 20 15.36
Frid.	28	8 30 26.30	9.805	18 58 0.9	−34.81	6 14.38	0.052	8 24 11.92
Sat.	29	8 34 21.32	9.779	18 43 55.8	35.60	6 12.85	0.078	8 28 8.47
Sun.	30	8 38 15.74	9.754	18 29 32.2	36.36	6 10.71	0.103	8 32 5.03
Mon.	31	8 42 9.55	9.729	18 14 50.4	37.11	6 7.97	0.128	8 36 1.58
Tues.	32	8 46 2.76	9.704	N. 17 59 50.6	−37.86	6 4.62	0.153	8 39 58.14

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
+ 9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	182	99 29 20.8	28 40.6	142.94	+ 0.21	0.0071868	+ 1.5	17 19 24.36
2	183	100 26 31.6	25 51.3	142.95	0.27	0.0071896	0.9	17 15 28.45
3	184	101 23 42.6	23 2.1	142.96	0.32	0.0071910	+ 0.3	17 11 32.54
4	185	102 20 53.7	20 13.1	142.97	+ 0.34	0.0071909	− 0.4	17 7 36.63
5	186	103 18 5.1	17 24.3	142.98	0.31	0.0071890	1.1	17 3 40.72
6	187	104 15 16.7	14 35.7	142.99	0.26	0.0071853	1.8	16 59 44.81
7	188	105 12 28.7	11 47.5	143.01	+ 0.18	0.0071800	− 2.6	16 55 48.89
8	189	106 9 41.2	8 59.8	143.03	+ 0.09	0.0071728	3.5	16 51 52.98
9	190	107 6 54.2	6 12.6	143.05	− 0.03	0.0071634	4.4	16 47 57.07
10	191	108 4 7.6	3 25.8	143.07	− 0.17	0.0071518	− 5.3	16 44 1.16
11	192	109 1 21.4	0 39.4	143.09	0.31	0.0071379	6.3	16 40 5.25
12	193	109 58 35.8	57 53.6	143.11	0.45	0.0071216	7.3	16 36 9.34
13	194	110 55 50.6	55 8.3	143.13	− 0.56	0.0071029	− 8.3	16 32 13.43
14	195	111 53 5.9	52 23.5	143.14	0.67	0.0070816	9.3	16 28 17.52
15	196	112 50 21.6	49 39.0	143.16	0.76	0.0070577	10.4	16 24 21.61
16	197	113 47 37.7	46 54.9	143.17	− 0.83	0.0070312	− 11.5	16 20 25.70
17	198	114 44 54.2	44 11.2	143.19	0.85	0.0070021	12.7	16 16 29.80
18	199	115 42 11.1	41 28.0	143.20	0.86	0.0069704	13.8	16 12 33.88
19	200	116 39 28.4	38 45.1	143.22	− 0.82	0.0069362	− 14.8	16 8 37.96
20	201	117 36 45.9	36 2.5	143.23	0.76	0.0068996	15.8	16 4 42.05
21	202	118 34 3.7	33 20.1	143.25	0.67	0.0068608	16.7	16 0 46.14
22	203	119 31 21.9	30 38.1	143.26	− 0.58	0.0068198	− 17.5	15 56 50.24
23	204	120 28 40.4	27 56.5	143.28	0.46	0.0067768	18.3	15 52 54.33
24	205	121 25 59.3	25 15.3	143.29	0.33	0.0067319	19.0	15 48 58.42
25	206	122 23 18.6	22 34.4	143.31	− 0.19	0.0066853	− 19.7	15 45 2.51
26	207	123 20 38.4	19 54.0	143.33	− 0.05	0.0066372	20.3	15 41 6.59
27	208	124 17 58 7	17 14.2	143.36	+ 0.06	0.0065876	20.9	15 37 10.68
28	209	125 15 19.7	14 35.1	143.39	+ 0.15	0.0065366	− 21.5	15 33 14.77
29	210	126 12 41.4	11 56.7	143.42	0.22	0.0064843	22.1	15 29 18.87
30	211	127 10 3.8	9 18.9	143.45	0.28	0.0064306	22.7	15 25 22.96
31	212	128 7 27.0	6 41.9	143.49	0.29	0.0063756	23.3	15 21 27.05
32	213	129 4 51.2	4 6.0	143.53	+ 0.28	0.0063194	− 23.7	15 17 31.14

Note.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 13.4	16 17.3	59 25.7	+ 1.29	59 39.9	+ 1.06	12 45.9	2.41	15.7
2	16 20.4	16 22.6	59 51.3	0.81	59 59.5	0.55	13 42.9	2.34	16.7
3	16 24.0	16 24.5	60 4.6	+ 0.28	60 6.4	+ 0.03	14 38.1	2.26	17.7
4	16 24.2	16 23.1	60 5.3	− 0.21	60 1.3	− 0.44	15 31.4	2.18	18.7
5	16 21.3	16 18.9	59 54.7	0.64	59 45.9	0.81	16 23.3	2.14	19.7
6	16 16.0	16 12.7	59 35.2	0.95	59 23.0	1.07	17 14.6	2.14	20.7
7	16 9.0	16 5.1	59 9.5	− 1.16	58 55.1	− 1.23	18 6.0	2.16	21.7
8	16 1.0	15 56.7	58 40.0	1.28	58 24.4	1.31	18 58.2	2.20	22.7
9	15 52.4	15 48.0	58 8.5	1.33	57 52.5	1.33	19 51.3	2.23	23.7
10	15 43.7	15 39.3	57 36.5	− 1.33	57 20.5	− 1.32	20 45.2	2.25	24.7
11	15 35.0	15 30.7	57 4.6	1.31	56 48.9	1.29	21 39.2	2.24	25.7
12	15 26.5	15 22.4	56 33.5	1.27	56 18.3	1.25	22 32.3	2.18	26.7
13	15 18.3	15 14.3	56 3.4	− 1.23	55 48.8	− 1.19	23 23.8	2.10	27.7
14	15 10.5	15 6.9	55 34.8	1.15	55 21.3	1.10	δ		28.7
15	15 3.3	15 0.0	55 8.4	1.04	54 56.3	0.97	0 12.9	1.99	0.2
16	14 57.0	14 54.2	54 45.1	− 0.89	54 34.9	− 0.80	0 59.6	1.89	1.2
17	14 51.8	14 49.7	54 25.9	0.69	54 18.3	0.57	1 44.1	1.81	2.2
18	14 48.1	14 46.9	54 12.3	0.43	54 7.9	− 0.29	2 26.8	1.75	3.2
19	14 46.2	14 46.1	54 5.4	− 0.13	54 5.0	+ 0.05	3 8.4	1.72	4.2
20	14 46.5	14 47.7	54 6.7	+ 0.24	54 10.8	0.44	3 49.7	1.73	5.2
21	14 49.4	14 51.8	54 17.2	0.64	54 26.1	0.84	4 31.5	1.77	6.2
22	14 54.9	14 58.7	54 37.4	+ 1.05	54 51.2	+ 1.26	5 14.7	1.84	7.2
23	15 3.1	15 8.2	55 7.5	1.46	55 26.1	1.64	6 0.0	1.94	8.2
24	15 13.8	15 20.0	55 46.9	1.82	56 9.7	1.98	6 48.1	2.07	9.2
25	15 26.7	15 33.8	56 34.3	+ 2.12	57 0.3	+ 2.22	7 39.4	2.22	10.2
26	15 41.2	15 48.7	57 27.3	2.29	57 54.9	2.31	8 33.9	2.34	11.2
27	15 56.2	16 3.5	58 22.5	2.29	58 49.5	2.21	9 30.9	2.42	12.2
28	16 10.5	16 17.0	59 15.2	+ 2.08	59 39.1	+ 1.90	10 29.3	2.44	13.2
29	16 22.9	16 27.9	60 0.5	1.67	60 18.9	1.39	11 27.6	2.41	14.2
30	16 31.9	16 34.9	60 33.7	1.08	60 44.5	0.74	12 24.9	2.36	15.2
31	16 36.7	16 37.3	60 51.2	+ 0.38	60 53.5	+ 0.02	13 20.7	2.29	16.2
32	16 36.8	16 35.2	60 51.7	− 0.33	60 45.6	− 0.67	14 15.0	2.24	17.2

GREENWICH MEAN TIME

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m
	SATURDAY 1.					MONDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 53 56.55	2.4998	S. 19 17 54.5	5.649	0	20 51 32.74	2.3838	S. 12 31 26.9	10.865
1	18 56 26.51	2.4987	19 12 11.6	5.780	1	20 53 55.67	2.3807	12 20 32.6	10.944
2	18 58 56.40	2.4976	19 6 20.9	5.910	2	20 56 18.42	2.3776	12 9 33.6	11.022
3	19 1 26.22	2.4963	19 0 22.4	6.040	3	20 58 40.98	2.3744	11 58 30.0	11.098
4	19 3 55.96	2.4949	18 54 16.1	6.170	4	21 1 3.35	2.3713	11 47 21.9	11.173
5	19 6 25.61	2.4935	18 48 2.0	6.299	5	21 3 25.54	2.3682	11 36 9.3	11.246
6	19 8 55.18	2.4921	18 41 40.2	6.426	6	21 5 47.54	2.3652	11 24 52.4	11.318
7	19 11 24.66	2.4905	18 35 10.8	6.552	7	21 8 9.36	2.3621	11 13 31.2	11.388
8	19 13 54.04	2.4888	18 28 33.9	6.678	8	21 10 30.99	2.3590	11 2 5.8	11.457
9	19 16 23.32	2.4871	18 21 49.4	6.804	9	21 12 52.44	2.3559	10 50 36.4	11.524
10	19 18 52.49	2.4853	18 14 57.4	6.928	10	21 15 13.70	2.3528	10 39 3.0	11.590
11	19 21 21.56	2.4836	18 7 58.0	7.052	11	21 17 34.78	2.3498	10 27 25.6	11.655
12	19 23 50.52	2.4817	18 0 51.1	7.176	12	21 19 55.68	2.3468	10 15 44.4	11.717
13	19 26 19.36	2.4797	17 53 36.9	7.298	13	21 22 16.40	2.3438	10 3 59.5	11.779
14	19 28 48.08	2.4776	17 46 15.4	7.418	14	21 24 36.94	2.3408	9 52 10.9	11.840
15	19 31 16.67	2.4754	17 38 46.7	7.538	15	21 26 57.30	2.3378	9 40 18.7	11.899
16	19 33 45.13	2.4733	17 31 10.8	7.657	16	21 29 17.48	2.3349	9 28 23.0	11.956
17	19 36 13.47	2.4712	17 23 27.8	7.776	17	21 31 37.49	2.3320	9 16 24.0	12.011
18	19 38 41.68	2.4690	17 15 37.7	7.893	18	21 33 57.32	2.3291	9 4 21.7	12.065
19	19 41 9.75	2.4666	17 7 40.6	8.009	19	21 36 16.98	2.3262	8 52 16.2	12.118
20	19 43 37.67	2.4642	16 59 36.6	8.124	20	21 38 36.46	2.3233	8 40 7.5	12.170
21	19 46 5.45	2.4617	16 51 25.7	8.238	21	21 40 55.77	2.3205	8 27 55.8	12.220
22	19 48 33.08	2.4592	16 43 8.0	8.352	22	21 43 14.92	2.3177	8 15 41.1	12.268
23	19 51 0.56	2.4567	S. 16 34 43.5	8.463	23	21 45 33.90	2.3149	S. 8 3 23.6	12.315
	SUNDAY 2.					TUESDAY 4.			
0	19 53 27.89	2.4542	S. 16 26 12.4	8.573	0	21 47 52.71	2.3122	S. 7 51 3.3	12.361
1	19 55 55.06	2.4516	16 17 34.7	8.683	1	21 50 11.36	2.3095	7 38 40.3	12.405
2	19 58 22.08	2.4490	16 8 50.4	8.792	2	21 52 29.85	2.3068	7 26 14.7	12.447
3	20 0 48.94	2.4463	15 59 59.6	8.900	3	21 54 48.17	2.3041	7 13 46.7	12.488
4	20 3 15.63	2.4435	15 51 2.4	9.006	4	21 57 6.34	2.3015	7 1 16.2	12.528
5	20 5 42.16	2.4407	15 41 58.9	9.111	5	21 59 24.35	2.2989	6 48 43.3	12.567
6	20 8 8.52	2.4379	15 32 49.1	9.215	6	22 1 42.21	2.2963	6 36 8.2	12.603
7	20 10 34.71	2.4351	15 23 33.1	9.317	7	22 3 59.91	2.2938	6 23 30.9	12.638
8	20 13 0.73	2.4322	15 14 11.0	9.419	8	22 6 17.47	2.2914	6 10 51.6	12.672
9	20 15 26.58	2.4294	15 4 42.8	9.519	9	22 8 34.88	2.2890	5 58 10.3	12.704
10	20 17 52.26	2.4265	14 55 8.7	9.618	10	22 10 52.15	2.2866	5 45 27.1	12.736
11	20 20 17.76	2.4235	14 45 28.7	9.716	11	22 13 9.27	2.2842	5 32 42.0	12.766
12	20 22 43.08	2.4205	14 35 42.8	9.812	12	22 15 26.25	2.2818	5 19 55.2	12.793
13	20 25 8.22	2.4175	14 25 51.2	9.907	13	22 17 43.09	2.2796	5 7 6.8	12.820
14	20 27 33.18	2.4146	14 15 53.9	10.001	14	22 19 59.80	2.2774	4 54 16.8	12.845
15	20 29 57.97	2.4116	14 5 51.1	10.093	15	22 22 16.38	2.2752	4 41 25.4	12.868
16	20 32 22.57	2.4085	13 55 42.7	10.185	16	22 24 32.83	2.2731	4 28 32.6	12.891
17	20 34 46.99	2.4054	13 45 28.9	10.276	17	22 26 49.15	2.2709	4 15 38.5	12.912
18	20 37 11.22	2.4023	13 35 9.7	10.364	18	22 29 5.34	2.2688	4 2 43.2	12.931
19	20 39 35.27	2.3993	13 24 45.2	10.451	19	22 31 21.41	2.2668	3 49 46.8	12.949
20	20 41 59.14	2.3962	13 14 15.6	10.536	20	22 33 37.36	2.2648	3 36 49.3	12.966
21	20 44 22.82	2.3931	13 3 40.9	10.621	21	22 35 53.19	2.2629	3 23 50.9	12.981
22	20 46 46.31	2.3900	12 53 1.1	10.704	22	22 38 8.91	2.2611	3 10 51.6	12.995
23	20 49 9.62	2.3869	12 42 16.4	10.785	23	22 40 24.52	2.2592	2 57 51.5	13.007
24	20 51 32.74	2.3838	S. 12 31 26.9	10.865	24	22 42 40.02	2.2574	S. 2 44 50.7	13.018

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 5.					**FRIDAY 7.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 42 40.02	2.2574	S. 2 44 50.7	13.018	0	0 29 53.87	2.2293	N. 7 27 30.7	12.013
1	22 44 55.41	2.2557	2 31 49.3	13.027	1	0 32 7.65	2.2299	7 39 30.0	11.962
2	22 47 10.70	2.2540	2 18 47.4	13.036	2	0 34 21.46	2.2305	7 51 26.2	11.911
3	22 49 25.89	2.2523	2 5 45.0	13.043	3	0 36 35.31	2.2312	8 3 19.3	11.858
4	22 51 40.98	2.2507	1 52 42.2	13.049	4	0 38 49.20	2.2318	8 15 9.2	11.805
5	22 53 55.98	2.2492	1 39 39.1	13.052	5	0 41 3.13	2.2325	8 26 55.9	11.750
6	22 56 10.89	2.2477	1 26 35.9	13.054	6	0 43 17.10	2.2332	8 38 39.2	11.693
7	22 58 25.71	2.2462	1 13 32.6	13.056	7	0 45 31.12	2.2341	8 50 19.1	11.636
8	23 0 40.44	2.2448	1 0 29.2	13.058	8	0 47 45.19	2.2350	9 1 55.6	11.578
9	23 2 55.09	2.2435	0 47 25.7	13.057	9	0 49 59.32	2.2359	9 13 28.5	11.519
10	23 5 9.66	2.2422	0 34 22.4	13.053	10	0 52 13.50	2.2367	9 24 57.9	11.459
11	23 7 24.15	2.2409	0 21 19.3	13.049	11	0 54 27.73	2.2376	9 36 23.6	11.397
12	23 9 38.57	2.2397	S. 0 8 16.5	13.043	12	0 56 42.01	2.2385	9 47 45.6	11.335
13	23 11 52.92	2.2386	N. 0 4 45.9	13.037	13	0 58 56.35	2.2396	9 59 3.8	11.272
14	23 14 7.20	2.2375	0 17 47.9	13.029	14	1 1 10.76	2.2407	10 10 18.2	11.208
15	23 16 21.42	2.2364	0 30 49.4	13.020	15	1 3 25.24	2.2418	10 21 28.7	11.142
16	23 18 35.57	2.2354	0 43 50.3	13.009	16	1 5 39.78	2.2428	10 32 35.2	11.075
17	23 20 49.67	2.2345	0 56 50.5	12.997	17	1 7 54.38	2.2439	10 43 37.7	11.007
18	23 23 3.71	2.2336	1 9 50.0	12.984	18	1 10 9.05	2.2451	10 54 36.1	10.939
19	23 25 17.70	2.2327	1 22 48.6	12.969	19	1 12 23.79	2.2463	11 5 30.4	10.870
20	23 27 31.64	2.2319	1 35 46.3	12.954	20	1 14 38.61	2.2476	11 16 20.5	10.799
21	23 29 45.53	2.2312	1 48 43.1	12.937	21	1 16 53.50	2.2488	11 27 6.3	10.728
22	23 31 59.38	2.2305	2 1 38.8	12.918	22	1 19 8.47	2.2501	11 37 47.8	10.656
23	23 34 13.19	2.2298	N. 2 14 33.3	12.898	23	1 21 23.51	2.2513	N.11 48 25.0	10.582
THURSDAY 6.					**SATURDAY 8.**				
0	23 36 26.96	2.2292	N. 2 27 26.6	12.877	0	1 23 38.62	2.2525	N.11 58 57.7	10.507
1	23 38 40.70	2.2287	2 40 18.6	12.856	1	1 25 53.81	2.2539	12 9 25.9	10.432
2	23 40 54.41	2.2282	2 53 9.3	12.833	2	1 28 9.09	2.2553	12 19 49.6	10.356
3	23 43 8.08	2.2277	3 5 58.5	12.808	3	1 30 24.45	2.2567	12 30 8.6	10.279
4	23 45 21.73	2.2273	3 18 46.2	12.782	4	1 32 39.89	2.2581	12 40 23.0	10.201
5	23 47 35.36	2.2270	3 31 32.3	12.755	5	1 34 55.42	2.2595	12 50 32.7	10.122
6	23 49 48.97	2.2267	3 44 16.8	12.727	6	1 37 11.03	2.2609	13 0 37.6	10.042
7	23 52 2.56	2.2264	3 56 59.5	12.697	7	1 39 26.73	2.2623	13 10 37.7	9.961
8	23 54 16.14	2.2262	4 9 40.4	12.667	8	1 41 42.51	2.2637	13 20 32.9	9.879
9	23 56 29.71	2.2261	4 22 19.5	12.635	9	1 43 58.38	2.2652	13 30 23.1	9.796
10	23 58 43.27	2.2260	4 34 56.6	12.602	10	1 46 14.31	2.2667	13 40 8.4	9.712
11	0 0 56.83	2.2259	4 47 31.7	12.567	11	1 48 30.39	2.2683	13 49 48.6	9.627
12	0 3 10.38	2.2259	5 0 4.6	12.531	12	1 50 46.54	2.2698	13 59 23.7	9.542
13	0 5 23.94	2.2260	5 12 35.4	12.495	13	1 53 2.77	2.2713	14 8 53.7	9.456
14	0 7 37.50	2.2260	5 25 4.0	12.457	14	1 55 19.09	2.2728	14 18 18.4	9.369
15	0 9 51.06	2.2261	5 37 30.2	12.417	15	1 57 35.51	2.2744	14 27 37.9	9.281
16	0 12 4.63	2.2263	5 49 54.0	12.377	16	1 59 52.02	2.2759	14 36 52.1	9.192
17	0 14 18.22	2.2266	6 2 15.4	12.336	17	2 2 8.62	2.2774	14 46 0.9	9.102
18	0 16 31.82	2.2268	6 14 34.3	12.293	18	2 4 25.31	2.2790	14 55 4.4	9.012
19	0 18 45.43	2.2271	6 26 50.6	12.249	19	2 6 42.10	2.2806	15 4 2.4	8.921
20	0 20 59.07	2.2275	6 39 4.2	12.204	20	2 8 58.98	2.2821	15 12 54.9	8.828
21	0 23 12.73	2.2279	6 51 15.1	12.158	21	2 11 15.95	2.2836	15 21 41.8	8.735
22	0 25 26.42	2.2283	7 3 23.2	12.111	22	2 13 33.01	2.2852	15 30 23.1	8.642
23	0 27 40.13	2.2288	7 15 28.4	12.062	23	2 15 50.17	2.2867	15 38 58.8	8.548
24	0 29 53.87	2.2293	N. 7 27 30.7	12.013	24	2 18 7.42	2.2882	N.15 47 28.8	8.452

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	2 18 7.42	2.2882	N.15 47 28.8	8.452
1	2 20 24.76	2.2898	15 55 53.0	8.355
2	2 22 42.20	2.2914	16 4 11.4	8.259
3	2 24 59.73	2.2929	16 12 24.1	8.162
4	2 27 17.35	2.2944	16 20 30.9	8.063
5	2 29 35.06	2.2059	16 28 31.7	7.964
6	2 31 52.86	2.2974	16 36 26.6	7.865
7	2 34 10.75	2.2989	16 44 15.5	7.764
8	2 36 28.73	2.3004	16 51 58.3	7.663
9	2 38 46.80	2.3018	16 59 35.0	7.561
10	2 41 4.95	2.3033	17 7 5.6	7.458
11	2 43 23.19	2.3048	17 14 30.0	7.355
12	2 45 41.52	2.3062	17 21 48.2	7.252
13	2 47 59.93	2.3075	17 29 0.2	7.147
14	2 50 18.42	2.3089	17 36 5.9	7.042
15	2 52 37.00	2.3103	17 43 5.2	6.936
16	2 54 55.66	2.3116	17 49 58.2	6.830
17	2 57 14.39	2.3129	17 56 44.8	6.723
18	2 59 33.20	2.3142	18 3 25.0	6.616
19	3 1 52.09	2.3154	18 9 58.7	6.508
20	3 4 11.05	2.3166	18 16 25.9	6.399
21	3 6 30.08	2.3177	18 22 46.6	6.290
22	3 8 49.18	2.3189	18 29 0.7	6.180
23	3 11 8.35	2.3201	N.18 35 8.2	6.069

MONDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	3 13 27.59	2.3212	N.18 41 9.0	5.958
1	3 15 46.89	2.3222	18 47 3.2	5.847
2	3 18 6.25	2.3232	18 52 50.7	5.736
3	3 20 25.68	2.3243	18 58 31.5	5.623
4	3 22 45.17	2.3253	19 4 5.5	5.511
5	3 25 4.71	2.3262	19 9 32.8	5.398
6	3 27 24.31	2.3271	19 14 53.3	5.285
7	3 29 43.96	2.3279	19 20 7.0	5.171
8	3 32 3.66	2.3287	19 25 13.8	5.056
9	3 34 23.40	2.3294	19 30 13.7	4.941
10	3 36 43.19	2.3302	19 35 6.7	4.826
11	3 39 3.02	2.3309	19 39 52.8	4.710
12	3 41 22.90	2.3316	19 44 31.9	4.594
13	3 43 42.81	2.3321	19 49 4.0	4.478
14	3 46 2.75	2.3327	19 53 29.2	4.362
15	3 48 22.73	2.3332	19 57 47.4	4.245
16	3 50 42.73	2.3335	20 1 58.6	4.128
17	3 53 2.75	2.3339	20 6 2.7	4.010
18	3 55 22.80	2.3342	20 9 59.8	3.892
19	3 57 42.86	2.3345	20 13 49.8	3.774
20	4 0 2.94	2.3348	20 17 32.7	3.656
21	4 2 23.04	2.3351	20 21 8.5	3.538
22	4 4 43.15	2.3352	20 24 37.2	3.419
23	4 7 3.26	2.3352	20 27 58.8	3.300
24	4 9 23.38	2.3353	N.20 31 13.2	3.181

TUESDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	4 9 23.38	2.3353	N.20 31 13.2	3.181
1	4 11 43.50	2.3353	20 34 20.5	3.062
2	4 14 3.61	2.3352	20 37 20.6	2.942
3	4 16 23.72	2.3350	20 40 13.6	2.823
4	4 18 43.81	2.3348	20 42 59.4	2.703
5	4 21 3.89	2.3346	20 45 38.0	2.583
6	4 23 23.96	2.3343	20 48 9.4	2.463
7	4 25 44.01	2.3339	20 50 33.6	2.343
8	4 28 4.03	2.3335	20 52 50.6	2.224
9	4 30 24.03	2.3331	20 55 0.5	2.105
10	4 32 44.00	2.3325	20 57 3.2	1.984
11	4 35 3.93	2.3318	20 58 58.6	1.863
12	4 37 23.82	2.3312	21 0 46.8	1.743
13	4 39 43.67	2.3305	21 2 27.8	1.623
14	4 42 3.48	2.3297	21 4 1.6	1.504
15	4 44 23.24	2.3289	21 5 28.3	1.385
16	4 46 42.95	2.3280	21 6 47.8	1.265
17	4 49 2.60	2.3270	21 8 0.1	1.145
18	4 51 22.19	2.3260	21 9 5.2	1.025
19	4 53 41.72	2.3249	21 10 3.1	0.906
20	4 56 1.18	2.3237	21 10 53.9	0.787
21	4 58 20.57	2.3225	21 11 37.5	0.667
22	5 0 39.88	2.3213	21 12 14.0	0.548
23	5 2 59.12	2.3200	N.21 12 43.3	0.429

WEDNESDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	5 5 18.28	2.3186	N.21 13 5.5	0.311
1	5 7 37.35	2.3171	21 13 20.6	0.192
2	5 9 56.33	2.3157	21 13 28.6	+ 0.073
3	5 12 15.23	2.3142	21 13 29.4	− 0.045
4	5 14 34.03	2.3125	21 13 23.2	0.162
5	5 16 52.73	2.3107	21 13 9.9	0.280
6	5 19 11.32	2.3089	21 12 49.6	0.397
7	5 21 29.80	2.3072	21 12 22.3	0.514
8	5 23 48.18	2.3054	21 11 48.0	0.631
9	5 26 6.45	2.3035	21 11 6.6	0.747
10	5 28 24.60	2.3014	21 10 18.3	0.862
11	5 30 42.62	2.2993	21 9 23.1	0.978
12	5 33 0.52	2.2973	21 8 20.9	1.094
13	5 35 18.30	2.2952	21 7 11.8	1.209
14	5 37 35.94	2.2929	21 5 55.8	1.323
15	5 39 53.45	2.2906	21 4 33.0	1.437
16	5 42 10.82	2.2883	21 3 3.3	1.551
17	5 44 28.05	2.2860	21 1 26.8	1.664
18	5 46 45.14	2.2836	20 59 43.6	1.777
19	5 49 2.08	2.2811	20 57 53.6	1.889
20	5 51 18.87	2.2786	20 55 56.9	2.002
21	5 53 35.51	2.2760	20 53 53 4	2.113
22	5 55 51 99	2.2733	20 51 43.3	2.224
23	5 58 8.31	2.2706	20 49 26.5	2.335
24	6 0 24.47	2.2679	N.20 47 3.1	2.445

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	THURSDAY 13					SATURDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 0 24.47	2.2679	N.20 47 3.1	2.445	0	7 45 25.07	2.0982	N.16 55 3.3	6.944
1	6 2 40.46	2.2652	20 44 33.1	2.554	1	7 47 30.84	2.0942	16 48 4.4	7.019
2	6 4 56.29	2.2624	20 41 56.6	2.662	2	7 49 36.38	2.0903	16 41 1.0	7.093
3	6 7 11.95	2.2595	20 39 13.6	2.771	3	7 51 41.68	2.0863	16 33 53.2	7.167
4	6 9 27.43	2.2565	20 36 24.1	2.879	4	7 53 46.74	2.0824	16 26 41.0	7.239
5	6 11 42.73	2.2536	20 33 28.1	2.987	5	7 55 51.57	2.0786	16 19 24.5	7.311
6	6 13 57.86	2.2507	20 30 25.7	3.093	6	7 57 56.17	2.0747	16 12 3.7	7.382
7	6 16 12.81	2.2476	20 27 16.9	3.199	7	8 0 0.53	2.0708	16 4 38.7	7.452
8	6 18 27.57	2.2444	20 24 1.8	3.304	8	8 2 4.66	2.0669	15 57 9.5	7.521
9	6 20 42.14	2.2412	20 20 40.4	3.409	9	8 4 8.56	2.0631	15 49 36.2	7.589
10	6 22 56.52	2.2381	20 17 12.7	3.513	10	8 6 12.23	2.0592	15 41 58.8	7.657
11	6 25 10.71	2.2349	20 13 38.8	3.617	11	8 8 15.67	2.0553	15 34 17.3	7.725
12	6 27 24.71	2.2316	20 9 58.6	3.721	12	8 10 18.87	2.0515	15 26 31.8	7.791
13	6 29 38.51	2.2283	20 6 12.3	3.823	13	8 12 21.85	2.0477	15 18 42.4	7.855
14	6 31 52.11	2.2250	20 2 19.9	3.924	14	8 14 24.60	2.0439	15 10 49.2	7.919
15	6 34 5.51	2.2217	19 58 21.4	4.026	15	8 16 27.12	2.0402	15 2 52.1	7.983
16	6 36 18.71	2.2183	19 54 16.8	4.126	16	8 18 29.42	2.0364	14 54 51.2	8.046
17	6 38 31.71	2.2149	19 50 6.3	4.225	17	8 20 31.49	2.0326	14 46 46.6	8.108
18	6 40 44.50	2.2114	19 45 49.8	4.324	18	8 22 33.33	2.0288	14 38 38.3	8.169
19	6 42 57.08	2.2079	19 41 27.4	4.422	19	8 24 34.95	2.0251	14 30 26.3	8.229
20	6 45 9.45	2.2044	19 36 59.1	4.520	20	8 26 36.35	2.0214	14 22 10.8	8.288
21	6 47 21.61	2.2009	19 32 25.0	4.617	21	8 28 37.52	2.0177	14 13 51.7	8.347
22	6 49 33.56	2.1973	19 27 45.1	4.713	22	8 30 38.47	2.0141	14 5 29.1	8.405
23	6 51 45.29	2.1937	N.19 22 59.5	4.808	23	8 32 39.21	2.0105	N.13 57 3.1	8.462
	FRIDAY 14.					SUNDAY 16.			
0	6 53 56.80	2.1900	N.19 18 8.1	4.903	0	8 34 39.73	2.0068	N.13 48 33.7	8.518
1	6 56 8.09	2.1863	19 13 11.1	4.997	1	8 36 40.03	2.0032	13 40 0.9	8.573
2	6 58 19.16	2.1827	19 8 8.5	5.090	2	8 38 40.12	1.9997	13 31 24.9	8.628
3	7 0 30.02	2.1791	19 3 0.3	5.182	3	8 40 39.99	1.9961	13 22 45.6	8.682
4	7 2 40.65	2.1754	18 57 46 6	5.274	4	8 42 39.65	1.9926	13 14 3.1	8.735
5	7 4 51.06	2.1716	18 52 27.4	5.366	5	8 44 39.10	1.9891	13 5 17.4	8.787
6	7 7 1.24	2.1678	18 47 2.7	5.456	6	8 46 38.34	1.9856	12 56 28.6	8.839
7	7 9 11.19	2.1640	18 41 32.7	5.545	7	8 48 37.37	1.9822	12 47 36.7	8.889
8	7 11 20.92	2.1602	18 35 57.3	5.634	8	8 50 36.20	1.9787	12 38 41.9	8.938
9	7 13 30.42	2.1564	18 30 16.6	5.722	9	8 52 34.82	1.9753	12 29 44.1	8.987
10	7 15 39.69	2.1526	18 24 30.7	5.808	10	8 54 33.24	1.9720	12 20 43.4	9.036
11	7 17 48.73	2.1487	18 18 39.6	5.895	11	8 56 31.46	1.9686	12 11 39.8	9.083
12	7 19 57.54	2.1449	18 12 43.3	5.981	12	8 58 29.48	1.9653	12 2 33.4	9.130
13	7 22 6.12	2.1411	18 6 41.9	6.066	13	9 0 27.30	1.9621	11 53 24.2	9.176
14	7 24 14.47	2.1372	18 0 35.4	6.149	14	9 2 24.93	1.9589	11 44 12.3	9.222
15	7 26 22.58	2.1333	17 54 24.0	6.232	15	9 4 22.37	1.9557	11 34 57.6	9.266
16	7 28 30.46	2.1294	17 48 7.6	6.315	16	9 6 19.61	1.9524	11 25 40.3	9.309
17	7 30 38.11	2.1255	17 41 46.2	6.397	17	9 8 16.66	1.9493	11 16 20.5	9.352
18	7 32 45.52	2.1216	17 35 20.0	6.477	18	9 10 13.53	1.9462	11 6 58.1	9.394
19	7 34 52.70	2.1177	17 28 49.0	6.557	19	9 12 10.21	1.9432	10 57 33.2	9.435
20	7 36 59.64	2.1137	17 22 13.2	6.636	20	9 14 6.71	1.9401	10 48 5.9	9.476
21	7 39 6.35	2.1098	17 15 32.7	6.714	21	9 16 3.02	1.9370	10 38 36.1	9.517
22	7 41 12.82	2.1059	17 8 47.5	6.792	22	9 17 59.15	1.9341	10 29 3.9	9.556
23	7 43 19.06	2.1021	17 1 57.7	6.868	23	9 19 55.11	1.9312	10 19 20.4	9.594
24	7 45 25.07	2.0982	N.16 55 3.3	6.944	24	9 21 50.90	1.9283	N.10 9 52.7	9.631

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	9 21 50.90	1.9283	N. 10 9 52.7	9.631
1	9 23 46.51	1.9254	10 0 13.7	9.668
2	9 25 41.95	1.9226	9 50 32.5	9.704
3	9 27 37.23	1.9199	9 40 49.2	9.739
4	9 29 32.34	1.9172	9 31 3.8	9.774
5	9 31 27.29	1.9144	9 21 16.3	9.808
6	9 33 22.07	1.9117	9 11 26.8	9.842
7	9 35 16.70	1.9092	9 1 35.3	9.874
8	9 37 11.17	1.9066	8 51 41.9	9.906
9	9 39 5.49	1.9040	8 41 46.6	9.937
10	9 40 59.65	1.9015	8 31 49.4	9.967
11	9 42 53.67	1.8991	8 21 50.5	9.997
12	9 44 47.54	1.8966	8 11 49.8	10.026
13	9 46 41.26	1.8943	8 1 47.4	10.054
14	9 48 34.85	1.8920	7 51 43.3	10.082
15	9 50 28.30	1.8897	7 41 37.5	10.110
16	9 52 21.62	1.8875	7 31 30.1	10.136
17	9 54 14.80	1.8853	7 21 21.2	10.161
18	9 56 7.85	1.8831	7 11 10.8	10.186
19	9 58 0.77	1.8810	7 0 58.9	10.210
20	9 59 53.57	1.8790	6 50 45.6	10.233
21	10 1 46.25	1.8770	6 40 30.9	10.256
22	10 3 38.81	1.8750	6 30 14.9	10.279
23	10 5 31.25	1.8730	N. 6 19 57.5	10.301

TUESDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	10 7 23.57	1.8711	N. 6 9 38.8	10.322
1	10 9 15.78	1.8693	5 59 18.9	10.342
2	10 11 7.89	1.8676	5 48 57.8	10.361
3	10 12 59.89	1.8659	5 38 35.6	10.380
4	10 14 51.79	1.8642	5 28 12.2	10.398
5	10 16 43.59	1.8625	5 17 47.8	10.416
6	10 18 35.29	1.8609	5 7 22.3	10.433
7	10 20 26.90	1.8593	4 56 55.8	10.449
8	10 22 18.41	1.8577	4 46 28.4	10.465
9	10 24 9.83	1.8563	4 36 0.0	10.481
10	10 26 1.17	1.8550	4 25 30.7	10.495
11	10 27 52.43	1.8536	4 15 0.6	10.507
12	10 29 43.60	1.8523	4 4 29.7	10.522
13	10 31 34.70	1.8511	3 53 58.0	10.534
14	10 33 25.73	1.8498	3 43 25.6	10.547
15	10 35 16.68	1.8486	3 32 52.4	10.558
16	10 37 7.56	1.8475	3 22 18.6	10.568
17	10 38 58.38	1.8465	3 11 44.2	10.578
18	10 40 49.14	1.8455	3 1 9.2	10.588
19	10 42 39.84	1.8445	2 50 33.7	10.597
20	10 44 30.48	1.8436	2 39 57.6	10.606
21	10 46 21.07	1.8428	2 29 21.0	10.613
22	10 48 11.61	1.8420	2 18 44.0	10.620
23	10 50 2.11	1.8412	2 8 6.6	10.627
24	10 51 52.56	1.8405	N. 1 57 28.7	10.634

WEDNESDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 51 52.56	1.8405	N. 1 57 28.7	10.634
1	10 53 42.97	1.8398	1 46 50.5	10.639
2	10 55 33.34	1.8392	1 36 12.1	10.643
3	10 57 23.68	1.8387	1 25 33.4	10.647
4	10 59 13.99	1.8382	1 14 54.5	10.650
5	11 1 4.27	1.8377	1 4 15.4	10 653
6	11 2 54.52	1.8373	0 53 36.1	10.656
7	11 4 44.75	1.8370	0 42 56.7	10.657
8	11 6 34.96	1.8367	0 32 17.2	10.658
9	11 8 25.16	1.8365	0 21 37.7	10.659
10	11 10 15.34	1.8363	0 10 58.1	10.659
11	11 12 5.51	1.8362	N. 0 0 18.6	10.658
12	11 13 55.68	1.8361	S. 0 10 20.9	10.657
13	11 15 45.84	1.8360	0 21 0.3	10.656
14	11 17 36.00	1.8361	0 31 39.6	10.654
15	11 19 26.17	1.8362	0 42 18.6	10.651
16	11 21 16.34	1.8364	0 52 57.7	10.647
17	11 23 6.53	1.8366	1 3 36.4	10.643
18	11 24 56.73	1.8368	1 14 14.9	10.639
19	11 26 46.94	1.8370	1 24 53.1	10.634
20	11 28 37.17	1.8374	1 35 30.9	10.628
21	11 30 27.43	1.8378	1 46 8.4	10.622
22	11 32 17.71	1.8382	1 56 45.5	10.615
23	11 34 8.02	1.8388	S. 2 7 22.2	10.607

THURSDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 35 58.37	1.8394	S. 2 17 58.4	10.599
1	11 37 48.75	1.8400	2 28 34.1	10.591
2	11 39 39.17	1.8406	2 39 9.3	10.582
3	11 41 29.62	1.8413	2 49 43.9	10.572
4	11 43 20.12	1.8421	3 0 17.9	10.561
5	11 45 10.67	1.8430	3 10 51.2	10.550
6	11 47 1.28	1.8439	3 21 23.9	10.539
7	11 48 51.94	1.8448	3 31 55.9	10.527
8	11 50 42.66	1.8457	3 42 27.1	10.514
9	11 52 33.43	1.8467	3 52 57.6	10.501
10	11 54 24.27	1.8479	4 3 27.2	10.487
11	11 56 15.18	1.8491	4 13 56.0	10.472
12	11 58 6.16	1.8503	4 24 23.9	10.457
13	11 59 57.22	1.8516	4 34 50.9	10.442
14	12 1 48.35	1.8529	4 45 16.9	10.426
15	12 3 39.56	1.8542	4 55 42.0	10.409
16	12 5 30.86	1.8557	5 6 6.0	10.392
17	12 7 22.25	1.8572	5 16 29.0	10.374
18	12 9 13.72	1.8587	5 26 50.9	10.356
19	12 11 5.29	1.8603	5 37 11.7	10.337
20	12 12 56.96	1.8620	5 47 31.3	10.317
21	12 14 48.73	1.8637	5 57 49.7	10.297
22	12 16 40.60	1.8654	6 8 6.9	10.276
23	12 18 32.57	1.8671	6 18 22.8	10.254
24	12 20 24.65	1.8690	S. 6 28 37.4	10.232

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 20 24.65	1.8690	S. 6 28 37.4	10.232
1	12 22 16.85	1.8710	6 38 50.7	10.210
2	12 24 9.17	1.8729	6 49 2.6	10.186
3	12 26 1.60	1.8749	6 59 13.0	10.162
4	12 27 54.16	1.8771	7 9 22.0	10.137
5	12 29 46.85	1.8792	7 19 29.5	10.112
6	12 31 39.66	1.8813	7 29 35.5	10.087
7	12 33 32.60	1.8835	7 39 40.0	10.061
8	12 35 25.68	1.8859	7 49 42.8	10.034
9	12 37 18.91	1.8883	7 59 44.0	10.006
10	12 39 12.28	1.8907	8 9 43.5	9.977
11	12 41 5.79	1.8931	8 19 41.3	9.949
12	12 42 59.45	1.8956	8 29 37.4	9.920
13	12 44 53.26	1.8982	8 39 31.7	9.890
14	12 46 47.23	1.9007	8 49 24.2	9.859
15	12 48 41.35	1.9033	8 59 14.8	9.827
16	12 50 35.63	1.9061	9 9 3.5	9.795
17	12 52 30.08	1.9089	9 18 50.2	9.762
18	12 54 24.70	1.9117	9 28 34.9	9.728
19	12 56 19.49	1.9146	9 38 17.6	9.695
20	12 58 14.45	1.9175	9 47 58.3	9.661
21	13 0 9.59	1.9205	9 57 36.9	9.626
22	13 2 4.91	1.9235	10 7 13.4	9.590
23	13 4 0.41	1.9265	S. 10 16 47.7	9.553

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	13 5 56.09	1.9296	S. 10 26 19.7	9.515
1	13 7 51.96	1.9328	10 35 49.5	9.477
2	13 9 48.03	1.9361	10 45 17.0	9.438
3	13 11 44.29	1.9393	10 54 42.1	9.398
4	13 13 40.75	1.9427	11 4 4.8	9.358
5	13 15 37.41	1.9461	11 13 25.1	9.318
6	13 17 34.28	1.9495	11 22 43.0	9.277
7	13 19 31.35	1.9529	11 31 58.4	9.235
8	13 21 28.63	1.9564	11 41 11.2	9.192
9	13 23 26.12	1.9600	11 50 21.4	9.147
10	13 25 23.83	1.9637	11 59 28.9	9.102
11	13 27 21.76	1.9673	12 8 33.7	9.057
12	13 29 19.91	1.9710	12 17 35.8	9.012
13	13 31 18.28	1.9748	12 26 35.2	8.966
14	13 33 16.88	1.9786	12 35 31.7	8.919
15	13 35 15.71	1.9824	12 44 25.4	8.871
16	13 37 14.77	1.9863	12 53 16.2	8.822
17	13 39 14.06	1.9902	13 2 4.0	8.772
18	13 41 13.59	1.9942	13 10 48.8	8.722
19	13 43 13.36	1.9982	13 19 30.6	8.671
20	13 45 13.37	2.0022	13 28 9.3	8.619
21	13 47 13.63	2.0063	13 36 44.9	8.567
22	13 49 14.13	2.0105	13 45 17.3	8.513
23	13 51 14.89	2.0147	13 53 46.4	8.458
24	13 53 15.90	2.0189	S. 14 2 12.3	8.403

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 53 15.90	2.0189	S. 14 2 12.3	8.403
1	13 55 17.16	2.0232	14 10 34.8	8.348
2	13 57 18.68	2.0275	14 18 54.0	8.292
3	13 59 20.46	2.0318	14 27 9.8	8.234
4	14 1 22.50	2.0362	14 35 22.1	8.176
5	14 3 24.81	2.0407	14 43 30.9	8.117
6	14 5 27.38	2.0451	14 51 36.2	8.057
7	14 7 30.22	2.0496	14 59 37.8	7.997
8	14 9 33.33	2.0542	15 7 35.8	7.936
9	14 11 36.72	2.0587	15 15 30.1	7.873
10	14 13 40.38	2.0633	15 23 20.6	7.810
11	14 15 44.32	2.0679	15 31 7.3	7.746
12	14 17 48.53	2.0726	15 38 50.1	7.681
13	14 19 53.03	2.0773	15 46 29.0	7.616
14	14 21 57.81	2.0821	15 54 4.0	7.550
15	14 24 2.88	2.0868	16 1 35.0	7.482
16	14 26 8.23	2.0916	16 9 1.9	7.413
17	14 28 13.87	2.0964	16 16 24.6	7.343
18	14 30 19.80	2.1013	16 23 43.1	7.273
19	14 32 26.02	2.1062	16 30 57.4	7.203
20	14 34 32.54	2.1111	16 38 7.5	7.131
21	14 36 39.35	2.1160	16 45 13.2	7.058
22	14 38 46.46	2.1209	16 52 14.5	6.985
23	14 40 53.86	2.1258	S. 16 59 11.4	6.912

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 43 1.56	2.1308	S. 17 6 3.9	6.837
1	14 45 9.56	2.1358	17 12 51.8	6.760
2	14 47 17.86	2.1409	17 19 35.1	6.682
3	14 49 26.47	2.1460	17 26 13.7	6.604
4	14 51 35.38	2.1510	17 32 47.6	6.525
5	14 53 44.59	2.1561	17 39 16.7	6.445
6	14 55 54.11	2.1612	17 45 41.0	6.365
7	14 58 3.93	2.1663	17 52 0.5	6.283
8	15 0 14.06	2.1714	17 58 15.0	6.200
9	15 2 24.50	2.1766	18 4 24.5	6.117
10	15 4 35.25	2.1817	18 10 29.0	6.033
11	15 6 46.31	2.1868	18 16 28.4	5.947
12	15 8 57.67	2.1919	18 22 22.6	5.860
13	15 11 9.34	2.1971	18 28 11.6	5.772
14	15 13 21.32	2.2023	18 33 55.3	5.684
15	15 15 33.62	2.2076	18 39 33.7	5.596
16	15 17 46.23	2.2127	18 45 6.8	5.507
17	15 19 59.14	2.2178	18 50 34.5	5.416
18	15 22 12.36	2.2230	18 55 56.7	5.324
19	15 24 25.90	2.2282	19 1 13.4	5.231
20	15 26 39.74	2.2333	19 6 24.4	5.136
21	15 28 53.89	2.2384	19 11 29.7	5.041
22	15 31 8.35	2.2436	19 16 29.3	4.946
23	15 33 23.12	2.2487	19 21 23.1	4.850
24	15 35 38.20	2.2539	S. 19 26 11.3	4.752

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 25.					THURSDAY 27			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 35 38.20	2.2539	S.19 26 11.3	4.752	0	17 29 11.85	2.4597	S.21 5 25.2	0.910
1	15 37 53.59	2.2590	19 30 53.5	4.654	1	17 31 39.52	2.4625	21 4 26.6	1.044
2	15 40 9.28	2.2641	19 35 29.8	4.555	2	17 34 7.35	2.4652	21 3 19.9	1.179
3	15 42 25.28	2.2692	19 40 0.1	4.454	3	17 36 35.34	2.4678	21 2 5.1	1.314
4	15 44 41.59	2.2743	19 44 24.3	4.352	4	17 39 3.49	2.4705	21 0 42.2	1.449
5	15 46 58.20	2.2794	19 48 42.4	4.250	5	17 41 31.80	2.4730	20 59 11.2	1.585
6	15 49 15.12	2.2845	19 52 54.3	4.147	6	17 44 0.25	2.4754	20 57 32.0	1.721
7	15 51 32.34	2.2895	19 57 0.0	4.043	7	17 46 28.85	2.4778	20 55 44.7	1.857
8	15 53 49.86	2.2944	20 0 59.5	3.939	8	17 48 57.59	2.4801	20 53 49.2	1.993
9	15 56 7.67	2.2994	20 4 52.7	3.833	9	17 51 26.46	2.4822	20 51 45.5	2.130
10	15 58 25.79	2.3044	20 8 39.5	3.726	10	17 53 55.46	2.4843	20 49 33.6	2.267
11	16 0 44.20	2.3093	20 12 19.9	3.618	11	17 56 24.58	2.4863	20 47 13.5	2.404
12	16 3 2.91	2.3142	20 15 53.7	3.509	12	17 58 53.82	2.4882	20 44 45.2	2.541
13	16 5 21.91	2.3191	20 19 21.0	3.401	13	18 1 23.17	2.4901	20 42 8.6	2.678
14	16 7 41.20	2.3240	20 22 41.8	3.291	14	18 3 52.63	2.4918	20 39 23.8	2.815
15	16 10 0.79	2.3288	20 25 55.9	3.179	15	18 6 22.19	2.4935	20 36 30.8	2.953
16	16 12 20.66	2.3336	20 29 3.3	3.067	16	18 8 51.85	2.4952	20 33 29.5	3.091
17	16 14 40.82	2.3384	20 32 4.0	2.955	17	18 11 21.61	2.4968	20 30 19.9	3.228
18	16 17 1.27	2.3431	20 34 57.9	2.842	18	18 13 51.46	2.4982	20 27 2.1	3.366
19	16 19 22.00	2.3477	20 37 45.0	2.727	19	18 16 21.39	2.4994	20 23 36.0	3.503
20	16 21 43.00	2.3522	20 40 25.2	2.612	20	18 18 51.39	2.5006	20 20 1.7	3.641
21	16 24 4.27	2.3568	20 42 58.4	2.495	21	18 21 21.46	2.5017	20 16 19.1	3.778
22	16 26 25.82	2.3615	20 45 24.6	2.377	22	18 23 51.60	2.5028	20 12 28.3	3.916
23	16 28 47.65	2.3661	S.20 47 43.7	2.259	23	18 26 21.80	2.5038	S.20 8 29.2	4.053
	WEDNESDAY 26.					FRIDAY 28.			
0	16 31 9.75	2.3705	S.20 49 55.7	2.141	0	18 28 52.06	2.5048	S.20 4 21.9	4.190
1	16 33 32.11	2.3748	20 52 0.6	2.022	1	18 31 22.37	2.5056	20 0 6.4	4.327
2	16 35 54.73	2.3792	20 53 58.4	1.902	2	18 33 52.73	2.5062	19 55 42.6	4.465
3	16 38 17.61	2.3835	20 55 48.9	1.781	3	18 36 23.12	2.5068	19 51 10.6	4.602
4	16 40 40.75	2.3877	20 57 32.1	1.659	4	18 38 53.55	2.5074	19 46 30.4	4.738
5	16 43 4.14	2.3919	20 59 8.0	1.537	5	18 41 24.01	2.5079	19 41 42.1	4.873
6	16 45 27.78	2.3961	21 0 36.6	1.415	6	18 43 54.50	2.5083	19 36 45.6	5.009
7	16 47 51.67	2.4002	21 1 57.8	1.291	7	18 46 25.01	2.5087	19 31 41.0	5.145
8	16 50 15.80	2.4042	21 3 11.5	1.166	8	18 48 55.54	2.5088	19 26 28.2	5.281
9	16 52 40.17	2.4081	21 4 17.7	1.040	9	18 51 26.07	2.5089	19 21 7.3	5.416
10	16 55 4.77	2.4120	21 5 16.3	0.913	10	18 53 56.61	2.5090	19 15 38.3	5.550
11	16 57 29.61	2.4159	21 6 7.3	0.787	11	18 56 27.15	2.5090	19 10 1.3	5.683
12	16 59 54.68	2.4197	21 6 50.7	0.660	12	18 58 57.69	2.5089	19 4 16.3	5.817
13	17 2 19.98	2.4234	21 7 26.5	0.532	13	19 1 28.22	2.5087	18 58 23.3	5.950
14	17 4 45.49	2.4270	21 7 54.6	0.404	14	19 3 58.74	2.5085	18 52 22.3	6.082
15	17 7 11.22	2.4306	21 8 15.0	0.275	15	19 6 29.24	2.5081	18 46 13.4	6.214
16	17 9 37.16	2.4341	21 8 27.6	0.145	16	19 8 59.71	2.5076	18 39 56.6	6.346
17	17 12 3.31	2.4376	21 8 32.4	− 0.015	17	19 11 30.15	2.5071	18 33 31.9	6.477
18	17 14 29.67	2.4410	21 8 29.4	+ 0.115	18	19 14 0.56	2.5066	18 26 59.3	6.607
19	17 16 56.23	2.4442	21 8 18.6	0.247	19	19 16 30.94	2.5060	18 20 19.0	6.737
20	17 19 22.98	2.4474	21 7 59.8	0.379	20	19 19 1.28	2.5053	18 13 30.9	6.866
21	17 21 49.92	2.4506	21 7 33.1	0.512	21	19 21 31.57	2.5045	18 6 35.1	6.994
22	17 24 17.05	2.4537	21 6 58.4	0.644	22	19 24 1.82	2.5037	17 59 31.6	7.121
23	17 26 44.36	2.4567	21 6 15.8	0.777	23	19 26 32.01	2.5027	17 52 20.5	7.248
24	17 29 11.85	2.4597	S.21 5 25.2	0.910	24	19 29 2.14	2.5017	S.17 45 1.8	7.375

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	19 29 2.14	2.5017	S. 17 45 1.8	7.375
1	19 31 32.21	2.5006	17 37 35.5	7.500
2	19 34 2.21	2.4995	17 30 1.8	7.624
3	19 36 32.15	2.4984	17 22 20.6	7.748
4	19 39 2.02	2.4972	17 14 32.0	7.871
5	19 41 31.81	2.4958	17 6 36.1	7.992
6	19 44 1.51	2.4943	16 58 33.0	8.112
7	19 46 31.13	2.4929	16 50 22.7	8.232
8	19 49 0.66	2.4915	16 42 5.1	8.352
9	19 51 30.11	2.4900	16 33 40.4	8.470
10	19 53 59.46	2.4883	16 25 8.7	8.587
11	19 56 28.71	2.4867	16 16 30.0	8.703
12	19 58 57.86	2.4850	16 7 44.3	8.818
13	20 1 26.91	2.4832	15 58 51.8	8.932
14	20 3 55.85	2.4814	15 49 52.5	9.044
15	20 6 24.68	2.4796	15 40 46.5	9.156
16	20 8 53.40	2.4777	15 31 33.8	9.267
17	20 11 22.01	2.4758	15 22 14.5	9.377
18	20 13 50.50	2.4738	15 12 48.6	9.485
19	20 16 18.87	2.4718	15 3 16.3	9.592
20	20 18 47.12	2.4697	14 53 37.6	9.698
21	20 21 15.24	2.4677	14 43 52.6	9.802
22	20 23 43.24	2.4656	14 34 1.4	9.905
23	20 26 11.11	2.4634	S. 14 24 4.0	10.007

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	20 28 38.85	2.4612	S. 14 14 0.5	10.108
1	20 31 6.46	2.4590	14 3 51.0	10.207
2	20 33 33.93	2.4567	13 53 35.6	10.306
3	20 36 1.27	2.4545	13 43 14.3	10.403
4	20 38 28.47	2.4522	13 32 47.3	10.498
5	20 40 55.53	2.4499	13 22 14.6	10.592
6	20 43 22.46	2.4476	13 11 36.3	10.684
7	20 45 49.24	2.4452	13 0 52.5	10.776
8	20 48 15.88	2.4428	12 50 3.2	10.866
9	20 50 42.38	2.4405	12 39 8.6	10.954
10	20 53 8.74	2.4381	12 28 8.7	11.042
11	20 55 34.95	2.4356	12 17 3.6	11.128
12	20 58 1.01	2.4331	12 5 53.4	11.212
13	21 0 26.92	2 4307	11 54 38.2	11.294
14	21 2 52.69	2.4283	11 43 18.1	11.375
15	21 5 18.31	2.4257	11 31 53.2	11.454
16	21 7 43.78	2.4233	11 20 23.6	11.532
17	21 10 9.10	2.4208	11 8 49.3	11.609
18	21 12 34.28	2.4184	10 57 10.5	11.684
19	21 14 59.31	2.4158	10 45 27.2	11.758
20	21 17 24.18	2.4133	10 33 39.5	11.830
21	21 19 48.90	2.4108	10 21 47.6	11.900
22	21 22 13.47	2.4083	10 9 51.5	11.969
23	21 24 37.89	2.4058	9 57 51.3	12.036
24	21 27 2.17	2.4034	S. 9 45 47.2	12.101

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 27 2.17	2.4034	S. 9 45 47.2	12.101
1	21 29 26.30	2.4009	9 33 39.2	12.166
2	21 31 50.28	2.3984	9 21 27.3	12.229
3	21 34 14.11	2.3959	9 9 11.7	12.290
4	21 36 37.79	2.3935	8 56 52.5	12.349
5	21 39 1 33	2.3911	8 44 29.8	12.407
6	21 41 24.72	2.3886	8 32 3.7	12.463
7	21 43 47.96	2.3862	8 19 34.3	12.518
8	21 46 11.06	2.3838	8 7 1.6	12.571
9	21 48 34.02	2.3815	7 54 25.8	12.622
10	21 50 56.84	2.3791	7 41 47.0	12.671
11	21 53 19.51	2.3767	7 29 5.3	12.719
12	21 55 42.04	2.3743	7 16 20.7	12.766
13	21 58 4.43	2.3720	7 3 33.4	12.810
14	22 0 26.68	2.3697	6 50 43.5	12.853
15	22 2 48.80	2.3675	6 37 51.0	12.895
16	22 5 10.78	2.3652	6 24 56.1	12.935
17	22 7 32.63	2.3630	6 11 58.8	12.973
18	22 9 54.34	2.3608	5 58 59.3	13.009
19	22 12 15.92	2.3586	5 45 57.7	13.044
20	22 14 37.37	2.3564	5 32 54.0	13.077
21	22 16 58.69	2.3543	5 19 48.4	13.108
22	22 19 19.89	2.3522	5 6 41.0	13.138
23	22 21 40.96	2.3502	S. 4 53 31.8	13.167

TUESDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 24 1.91	2.3481	S. 4 40 20.9	13.194

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter	7	9	52.4
● New Moon	14	19	1.4
☽ First Quarter . . .	22	22	17.5
○ Full Moon	30	2	1.9

	d	h
☾ Perigee.	3	13.5
☾ Apogee.	19	8.3
☾ Perigee.	31	12.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	80° 41′ 8″	2234	82° 28′ 45″	2225	84° 16′ 35″	2216	86° 4′ 38″	2208
	Antares	W.	35 31 4	2287	37 17 22	2274	39 3 59	2262	40 50 54	2251
	Fomalhaut	E.	54 21 56	3015	52 52 2	3044	51 22 44	3078	49 54 8	3117
	α Pegasi	E.	69 7 55	2401	67 24 21	2396	65 40 40	2392	63 56 54	2390
	α Arietis	E.	112 11 50	2281	110 25 23	2271	108 38 41	2262	106 51 45	2253
2	Spica	W.	95 7 37	2176	96 56 40	2172	98 45 50	2167	100 35 7	2163
	Antares	W.	49 49 15	2207	51 37 32	2201	53 25 58	2195	55 14 33	2190
	Fomalhaut	E.	42 45 27	3420	41 23 33	3509	40 3 19	3612	38 44 58	3729
	α Pegasi	E.	55 17 47	2396	53 34 7	2403	51 50 36	2410	50 7 15	2419
	α Arietis	E.	97 54 8	2218	96 6 7	2213	94 17 59	2208	92 29 44	2204
3	Antares	W.	64 19 2	2174	66 8 8	2172	67 57 17	2172	69 46 27	2172
	α Pegasi	E.	41 35 0	2504	39 53 53	2533	38 13 25	2564	36 33 41	2602
	α Arietis	E.	83 27 16	2193	81 38 38	2193	79 50 0	2194	78 1 23	2194
	Aldebaran	E.	116 36 54	2169	114 47 39	2168	112 58 23	2167	111 9 6	2167
4	Antares	W.	78 52 6	2178	80 41 7	2180	82 30 4	2184	84 18 56	2188
	α Aquilæ	W.	34 42 56	3773	35 58 26	3638	37 16 19	3521	38 36.20	3419
	α Arietis	E.	68 58 51	2207	67 10 34	2211	65 22 23	2216	63 34 19	2221
	Aldebaran	E.	102 2 48	2173	100 13 40	2176	98 24 36	2179	96 35 37	2182
	Sun	E.	135 36 24	2467	133 54 25	2470	132 12 29	2472	130 30 36	2475
5	Antares	W.	93 21 41	2211	95 9 52	2217	96 57 54	2224	98 45 46	2230
	α Aquilæ	W.	45 40 59	3077	47 9 37	3031	48 39 11	2992	50 9 34	2958
	α Arietis	E.	54 36 18	2257	52 49 15	2266	51 2 25	2276	49 15 50	2286
	Saturn	E.	71 55 56	2227	70 8 8	2233	68 20 29	2239	66 32 59	2245
	Aldebaran	E.	87 32 14	2206	85 43 56	2212	83 55 47	2218	82 7 47	2225
	Sun	E.	122 2 35	2499	120 21 20	2505	118 40 14	2511	116 59 16	2517
6	α Aquilæ	W.	57 50 32	2844	59 24 3	2830	60 57 52	2818	62 31 56	2808
	α Arietis	E.	40 27 5	2350	38 42 19	2367	36 57 57	2384	35 14 0	2404
	Saturn	E.	57 38 2	2282	55 51 36	2289	54 5 21	2298	52 19 18	2307
	Aldebaran	E.	73 10 20	2262	71 23 24	2270	69 36 40	2278	67 50 8	2287
	Jupiter	E.	81 46 0	2313	80 0 20	2322	78 14 52	2330	76 29 36	2338
	Sun	E.	108 36 52	2555	106 56 55	2564	105 17 10	2572	103 37 36	2580
7	α Aquilæ	W.	70 24 41	2785	71 59 28	2785	73 34 16	2785	75 9 3	2788
	Fomalhaut	W.	44 31 12	3381	45 53 50	3327	47 17 30	3281	48 42 4	3240
	Saturn	E.	43 32 17	2352	41 47 33	2361	40 3 2	2371	38 18 45	2380
	Aldebaran	E.	59 0 42	2332	57 15 29	2342	55 30 30	2351	53 45 45	2361
	Jupiter	E.	67 46 18	2381	66 2 16	2390	64 18 27	2399	62 34 51	2408
	Sun	E.	95 22 48	2626	93 44 28	2635	92 6 21	2645	90 28 27	2655
8	α Aquilæ	W.	83 2 0	2809	84 36 16	2816	86 10 23	2824	87 44 20	2831
	Fomalhaut	W.	55 55 13	3100	57 23 23	3082	58 51 54	3067	60 20 44	3053
	α Pegasi	W.	35 16 8	2830	36 49 57	2805	38 24 19	2783	39 59 9	2766
	Saturn	E.	29 41 0	2434	27 58 14	2445	26 15 44	2458	24 33 31	2470
	Aldebaran	E.	45 5 42	2414	43 22 27	2425	41 39 28	2437	39 56 46	2448
	Jupiter	E.	54 0 8	2455	52 17 51	2465	50 35 48	2474	48 53 58	2484
	Sun	E.	82 22 17	2704	80 45 43	2715	79 9 23	2725	77 33 16	2735
9	Fomalhaut	W.	67 48 11	3015	69 18 5	3012	70 48 3	3011	72 18 2	3010

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica	W.	87° 52′ 53″	2201	89° 41′ 19″	2194	91° 29′ 56″	2188	93° 18′ 42″	2182
	Antares	W.	42 38 6	2240	44 25 34	2231	46 13 15	2223	48 1 9	2214
	Fomalhaut	E.	48 26 19	3163	46 59 25	3214	45 33 33	3274	44 8 51	3341
	α Pegasi	E.	62 13 5	2389	60 29 14	2389	58 45 23	2389	57 1 33	2392
	α Arietis	E.	105 4 36	2245	103 17 15	2237	101 29 43	2230	99 42 0	2224
2	Spica	W.	102 24 30	2160	104 13 58	2157	106 3 30	2155	107 53 5	2153
	Antares	W.	57 3 15	2186	58 52 4	2182	60 40 59	2178	62 29 59	2176
	Fomalhaut	E.	37 28 42	3865	36 14 47	4022	35 3 29	4203	33 55 6	4414
	α Pegasi	E.	48 24 8	2431	46 41 18	2445	44 58 47	2462	43 16 40	2481
	α Arietis	E.	90 41 22	2200	88 52 55	2198	87 4 25	2196	85 15 52	2194
3	Antares	W.	71 35 37	2172	73 24 46	2173	75 13 54	2174	77 3 1	2176
	α Pegasi	E.	34 54 49	2646	33 16 57	2698	31 40 14	2760	30 4 53	2832
	α Arietis	E.	76 12 47	2195	74 24 12	2198	72 35 41	2200	70 47 14	2203
	Aldebaran	E.	109 19 48	2167	107 30 30	2168	105 41 14	2169	103 52 0	2170
4	Antares	W.	86 7 42	2192	87 56 22	2196	89 44 56	2201	91 33 22	2206
	α Aquilæ	W.	39 58 15	3331	41 21 51	3253	42 46 57	3186	44 13 23	3128
	α Arietis	E.	61 46 23	2227	59 58 36	2234	58 10 59	2241	56 23 33	2249
	Aldebaran	E.	94 46 43	2186	92 57 55	2191	91 9 14	2196	89 20 40	2201
	SUN	E.	128 48 47	2479	127 7 4	2484	125 25 28	2488	123 43 58	2493
5	Antares	W.	100 33 29	2237	102 21 1	2244	104 8 23	2251	105 55 34	2260
	α Aquilæ	W.	51 40 39	2929	53 12 21	2902	54 44 37	2880	56 17 22	2860
	α Arietis	E.	47 29 30	2298	45 43 27	2309	43 57 41	2322	42 12 13	2335
	SATURN	E.	64 45 39	2252	62 58 29	2259	61 11 29	2266	59 24 40	2274
	Aldebaran	E.	80 19 56	2231	78 32 15	2239	76 44 45	2247	74 57 27	2254
	SUN	E.	115 18 27	2525	113 37 48	2532	111 57 19	2539	110 17 0	2547
6	α Aquilæ	W.	64 6 13	2801	65 40 40	2795	67 15 15	2790	68 49 56	2787
	α Arietis	E.	33 30 31	2425	31 47 32	2449	30 5 7	2477	28 23 21	2507
	SATURN	E.	50 33 28	2315	48 47 50	2324	47 2 26	2333	45 17 15	2342
	Aldebaran	E.	66 3 49	2295	64 17 42	2304	62 31 48	2313	60 46 8	2323
	JUPITER	E.	74 44 32	2346	72 59 40	2355	71 15 0	2364	69 30 33	2372
	SUN	E.	101 58 14	2589	100 19 4	2598	98 40 6	2607	97 1 21	2616
7	α Aquilæ	W.	76 43 47	2790	78 18 28	2793	79 58 5	2798	81 27 36	2803
	Fomalhaut	W.	50 7 26	3204	51 33 30	3173	53 0 12	3144	54 27 28	3120
	SATURN	E.	36 34 42	2390	34 50 53	2401	33 7 20	2412	31 24 2	2423
	Aldebaran	E.	52 1 14	2371	50 16 58	2382	48 32 57	2393	46 49 12	2403
	JUPITER	E.	60 51 28	2417	59 8 18	2426	57 25 21	2436	55 42 38	2445
	SUN	E.	88 50 46	2665	87 13 19	2675	85 36 5	2684	83 59 4	2695
8	α Aquilæ	W.	89 18 7	2841	90 51 42	2851	92 25 4	2862	93 58 12	2873
	Fomalhaut	W.	61 49 51	3043	63 19 11	3034	64 48 42	3026	66 18 23	3020
	α Pegasi	W.	41 34 22	2752	43 9 53	2741	44 45 38	2733	46 21 34	2726
	SATURN	E.	22 51 36	2484	21 10 0	2499	19 28 45	2515	17 47 52	2533
	Aldebaran	E.	38 14 20	2460	36 32 11	2473	34 50 20	2487	33 8 48	2500
	JUPITER	E.	47 12 22	2493	45 30 59	2502	43 49 49	2512	42 8 53	2522
	SUN	E.	75 57 23	2745	74 21 43	2756	72 46 17	2766	71 11 5	2776
9	Fomalhaut	W.	73 48 2	3010	75 18 2	3012	76 48 0	3014	78 17 56	3017

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
9	α Pegasi	W.	47° 57′ 39″	2721	49° 33′ 51″	2717	51° 10′ 8″	2715	52° 46′ 28″	2713
	Aldebaran	E.	31 27 35	2515	29 46 42	2530	28 6 10	2546	26 26 1	2564
	Jupiter	E.	40 28 10	2531	38 47 40	2541	37 7 24	2551	35 27 21	2561
	Sun	E.	69 36 6	2786	68 1 20	2797	66 26 48	2808	64 52 30	2818
10	Fomalhaut	W.	79 47 48	3021	81 17 35	3026	82 47 16	3031	84 16 50	3038
	α Pegasi	W.	60 48 6	2722	62 24 17	2725	64 0 24	2729	65 36 25	2733
	Jupiter	E.	27 10 27	2609	25 31 44	2619	23 53 15	2629	22 15 0	2639
	Sun	E.	57 4 21	2870	55 31 24	2880	53 58 40	2891	52 26 10	2901
11	Fomalhaut	W.	91 42 27	3079	93 11 2	3090	94 39 24	3101	96 7 32	3113
	α Pegasi	W.	73 34 52	2762	75 10 10	2769	76 45 19	2775	78 20 19	2782
	α Arietis	W.	29 57 26	2771	31 32 32	2766	33 7 45	2762	34 43 3	2760
	Sun	E.	44 47 2	2955	43 15 53	2967	41 44 59	2978	40 14 19	2989
12	α Pegasi	W.	86 12 52	2822	87 46 51	2831	89 20 38	2840	90 54 14	2848
	α Arietis	W.	42 39 39	2768	44 14 49	2771	45 49 55	2775	47 24 55	2780
	Sun	E.	32 44 35	3050	31 15 24	3064	29 46 30	3077	28 17 52	3091
16	Sun	W.	14 29 57	3477	15 50 47	3457	17 11 59	3444	18 33 26	3436
	Mars	E.	32 24 49	3259	30 59 49	3273	29 35 6	3288	28 10 41	3306
	Spica	E.	74 35 30	2950	73 4 14	2958	71 33 8	2965	70 2 12	2973
17	Sun	W.	25 22 9	3425	26 43 57	3426	28 5 44	3429	29 27 28	3431
	Spica	E.	62 29 43	3006	60 59 38	3012	59 29 40	3018	57 59 50	3024
	Antares	E.	107 56 8	3026	106 26 28	3033	104 56 56	3039	103 27 31	3043
18	Sun	W.	36 15 25	3445	37 36 51	3447	38 58 14	3450	40 19 34	3453
	Spica	E.	50 32 21	3049	49 3 9	3054	47 34 3	3058	46 5 2	3061
	Antares	E.	96 2 1	3069	94 33 13	3072	93 4 29	3076	91 35 50	3080
19	Sun	W.	47 5 35	3462	48 26 42	3463	49 47 47	3464	51 8 51	3464
	Spica	E.	38 40 56	3075	37 12 16	3078	35 43 39	3079	34 15 4	3080
	Antares	E.	84 13 38	3094	82 45 21	3096	81 17 7	3097	79 48 54	3099
20	Sun	W.	57 54 14	3461	59 15 22	2459	60 36 32	3457	61 57 44	3455
	Regulus	W.	27 37 36	3170	29 4 21	3160	30 31 18	3151	31 58 26	3143
	Antares	E.	72 28 4	3100	70 59 54	3099	69 31 43	3097	68 3 30	3096
21	Sun	W.	68 44 38	3435	70 6 15	3430	71 27 58	3423	72 49 48	3416
	Regulus	W.	39 16 27	3105	40 44 31	3097	42 12 44	3089	43 41 7	3081
	Venus	W.	31 44 19	3608	33 2 45	3596	34 21 24	3584	35 40 16	3572
	Mars	W.	25 12 26	3408	26 34 34	3392	27 57 0	3376	29 19 44	3362
	Antares	E.	60 41 46	3082	59 13 14	3078	57 44 37	3073	56 15 55	3069
22	Sun	W.	79 40 58	3379	81 3 39	3369	82 26 31	3359	83 49 34	3349
	Regulus	W.	51 5 34	3037	52 35 1	3027	54 4 40	3018	55 34 31	3008
	Venus	W.	42 17 52	3512	43 38 3	3499	44 58 28	3487	46 19 7	3474
	Mars	W.	36 17 20	3296	37 41 36	3283	39 6 7	3270	40 30 54	3257
	Antares	E.	48 50 49	3040	47 21 26	3033	45 51 54	3026	44 22 14	3020
23	Sun	W.	90 47 54	3292	92 12 15	3279	93 36 51	3265	95 1 43	3252
	Regulus	W.	63 7 9	2950	64 38 25	2938	66 9 56	2924	67 41 44	2912

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
9	α Pegasi	W.	54° 22′ 50″	2713	55° 59′ 12″	2714	57° 35′ 33″	2716	59° 11′ 51″	2719
	Aldebaran	E.	24 46 16	2583	23 6 58	2606	21 28 11	2632	19 49 59	2662
	Jupiter	E.	33 47 32	2570	32 7 56	2580	30 28 33	2589	28 49 23	2599
	Sun	E.	63 18 25	2828	61 44 34	2838	60 10 56	2849	58 37 32	2859
10	Fomalhaut	W.	85 46 16	3044	87 15 34	3052	88 44 42	3060	90 13 40	3069
	α Pegasi	W.	67 12 21	2738	68 48 10	2744	70 23 52	2750	71 59 26	2756
	Jupiter	E.	20 36 58	2649	18 59 10	2660	17 21 37	2672	15 44 19	2684
	Sun	E.	50 53 53	2912	49 21 50	2924	47 50 1	2934	46 18 25	2944
11	Fomalhaut	W.	97 35 26	3126	99 3 4	3138	100 30 27	3153	101 57 33	3168
	α Pegasi	W.	79 55 10	2790	81 29 51	2798	83 4 22	2806	84 38 42	2814
	α Arietis	W.	36 18 24	2759	37 53 46	2760	39 29 7	2762	41 4 25	2765
	Sun	E.	38 43 53	3001	37 13 41	3013	35 43 44	3025	34 14 2	3037
12	α Pegasi	W.	92 27 39	2858	94 0 52	2867	95 33 53	2877	97 6 41	2887
	α Arietis	W.	48 59 49	2785	50 34 36	2791	52 9 16	2797	53 43 48	2803
	Sun	E.	26 49 32	3107	25 21 30	3124	23 53 50	3141	22 26 30	3160
16	Sun	W.	19 55 2	3430	21 16 45	3426	22 38 32	3424	24 0 21	3425
	Mars	E.	26 46 36	3325	25 22 53	3345	23 59 34	3369	22 36 42	3395
	Spica	E.	68 31 25	2980	67 0 47	2986	65 30 17	2993	63 59 56	3000
17	Sun	W.	30 49 9	3434	32 10 47	3436	33 32 23	3438	34 53 56	3442
	Spica	E.	56 30 7	3030	55 0 31	3034	53 31 1	3040	52 1 38	3045
	Antares	E.	101 58 12	3049	100 29 0	3054	98 59 54	3060	97 30 55	3064
18	Sun	W.	41 40 51	3455	43 2 5	3457	44 23 17	3459	45 44 27	3461
	Spica	E.	44 36 5	3065	43 7 12	3068	41 38 23	3071	40 9 38	3073
	Antares	E.	90 7 16	3083	88 38 46	3087	87 10 20	3089	85 41 57	3092
19	Sun	W.	52 29 55	3464	53 50 59	3464	55 12 3	3463	56 33 8	3463
	Spica	E.	32 46 30	3081	31 17 57	3082	29 49 25	3082	28 20 53	3081
	Antares	E.	78 20 43	3100	76 52 33	3100	75 24 23	3101	73 56 14	3100
20	Sun	W.	63 18 58	3452	64 40 16	3447	66 1 39	3444	67 23 6	3439
	Regulus	W.	33 25 44	3135	34 53 11	3128	36 20 47	3120	37 48 32	3112
	Antares	E.	66 35 15	3093	65 6 57	3091	63 38 37	3088	62 10 18	3086
21	Sun	W.	74 11 46	3410	75 33 51	3403	76 56 4	3395	78 18 26	3386
	Regulus	W.	45 9 40	3073	46 38 23	3065	48 7 16	3056	49 36 19	3047
	Venus	W.	36 59 21	3560	38 18 39	3548	39 38 10	3536	40 57 54	3524
	Mars	W.	30 42 44	3348	32 6 0	3334	33 29 32	3321	34 53 19	3309
	Antares	E.	54 47 7	3064	53 18 13	3058	51 49 12	3052	50 20 4	3047
22	Sun	W.	85 12 49	3338	86 36 16	3328	87 59 55	3316	89 28 48	3305
	Regulus	W.	57 4 34	2997	58 34 51	2985	60 5 22	2973	61 36 8	2962
	Venus	W.	47 40 0	3461	49 1 8	3447	50 22 31	3433	51 44 10	3419
	Mars	W.	41 55 56	3244	43 21 13	3231	44 46 46	3217	46 12 35	3204
	Antares	E.	42 52 26	3013	41 22 29	3005	39 52 22	2997	38 22 6	2989
23	Sun	W.	96 26 51	3238	97 52 15	3224	99 17 56	3209	100 43 55	3193
	Regulus	W.	69 13 48	2898	70 46 10	2883	72 18 50	2869	73 51 49	2855

GREENWICH MEAN TIME

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Venus	W.	53° 6′ 5″	3405	54° 28′ 16″	3390	55° 50′ 44″	3375	57° 13′ 29″	3360
	Mars	W.	47 38 40	3189	49 5 2	3175	50 31 41	3160	51 58 38	3146
	Antares	E.	36 51 40	2962	35 21 5	2974	33 50 20	2968	32 19 27	2961
	α Aquilæ	E.	90 6 33	3344	88 43 12	3332	87 19 38	3321	85 55 51	3309
24	Sun	W.	102 10 12	3178	103 36 48	3162	105 3 43	3146	106 30 57	3129
	Regulus	W.	75 25 6	2840	76 58 42	2825	78 32 38	2808	80 6 55	2792
	Venus	W.	64 11 51	3277	65 36 29	3259	67 1 28	3242	68 26 48	3224
	Mars	W.	59 17 57	3066	60 46 48	3050	62 15 59	3034	63 45 30	3017
	Spica	W.	21 24 3	2821	22 58 3	2805	24 32 23	2791	26 7 3	2775
	α Aquilæ	E.	78 53 43	3257	77 28 41	3247	76 3 28	3239	74 38 5	3231
25	Sun	W.	113 52 19	3042	115 21 40	3024	116 51 23	3005	118 21 29	2987
	Regulus	W.	88 3 35	3710	89 40 1	2693	91 16 50	2675	92 54 3	2658
	Venus	W.	75 38 54	3130	77 6 27	3110	78 34 24	3091	80 2 45	3071
	Mars	W.	71 18 33	2927	72 50 18	2909	74 22 26	2890	75 54 58	2871
	Spica	W.	34 5 45	2692	35 42 36	2674	37 19 51	2657	38 57 29	2639
	α Aquilæ	E.	67 28 49	3196	66 2 35	3192	64 36 16	3188	63 9 53	3187
	Fomalhaut	E.	95 31 6	3164	94 4 14	3144	92 36 58	3126	91 9 20	3108
26	Sun	W.	125 57 47	2894	127 30 13	2876	129 3 3	2857	130 36 17	2839
	Regulus	W.	101 6 5	2569	102 45 43	2551	104 25 45	2533	106 6 12	2515
	Venus	W.	87 30 37	2970	89 1 27	2950	90 32 42	2931	92 4 22	2910
	Mars	W.	83 43 44	2775	85 18 44	2756	86 54 9	2738	88 29 59	2718
	Spica	W.	47 11 43	2549	48 51 48	2530	50 32 19	2512	52 13 15	2494
	α Aquilæ	E.	55 58 3	3203	54 31 57	3212	53 6 2	3225	51 40 22	3241
	Fomalhaut	E.	83 45 51	3026	82 16 10	3012	80 46 12	2997	79 15 56	2985
27	Venus	W.	99 49 8	2811	101 23 21	2792	102 58 0	2772	104 33 5	2753
	Spica	W.	60 44 21	2403	62 27 51	2385	64 11 47	2368	65 56 8	2350
	α Aquilæ	E.	44 38 21	3389	43 15 52	3437	41 54 17	3494	40 33 46	3561
	Fomalhaut	E.	71 40 59	2936	70 9 26	2930	68 37 45	2925	67 5 58	2922
	α Pegasi	E.	88 22 44	2549	86 42 39	2532	85 2 10	2515	83 21 18	2499
28	Spica	W.	74 44 5	2268	76 30 52	2251	78 18 3	2236	80 5 37	2221
	Antares	W.	29 40 1	2345	31 24 55	2322	33 10 23	2300	34 56 23	2279
	Fomalhaut	E.	59 26 58	2939	57 55 29	2950	56 24 13	2964	54 53 15	2982
	α Pegasi	E.	74 51 30	2426	73 8 32	2413	71 25 16	2401	69 41 43	2391
29	Spica	W.	89 8 45	2154	90 58 22	2141	92 48 18	2130	94 38 31	2120
	Antares	W.	43 53 19	2194	45 41 56	2170	47 30 55	2166	49 20 14	2153
	Fomalhaut	E.	47 25 55	3144	45 58 39	3196	44 32 25	3257	43 7 23	3327
	α Pegasi	E.	61 0 31	2351	59 15 46	2346	57 30 54	2344	55 45 58	2343
	α Arietis	E.	103 49 43	2199	102 1 14	2187	100 12 27	2175	98 23 22	2163
30	Antares	W.	58 31 16	2101	60 22 14	2093	62 13 24	2086	64 4 45	2079
	α Pegasi	E.	47 1 46	2366	45 17 23	2378	43 33 17	2394	41 49 34	2414
	α Arietis	E.	89 13 59	2118	87 23 27	2111	85 32 44	2105	83 41 52	2099
	Aldebaran	E.	122 24 50	2092	120 33 39	2085	118 42 16	2077	116 50 42	2072
31	Antares	W.	73 23 38	2058	75 15 42	2056	77 7 49	2055	78 59 58	2055
	α Arietis	E.	74 25 52	2084	72 34 28	2084	70 43 4	2084	68 51 40	2085
	Aldebaran	E.	107 30 52	2051	105 38 37	2049	103 46 19	2048	101 53 59	2047

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	VENUS	W.	58° 36′ 32″	3343	59° 59′ 54″	3327	61° 23′ 34″	3311	62° 47′ 33″	3294
	MARS	W.	53 25 52	3131	54 53 24	3115	56 21 15	3099	57 49 26	3082
	Antares	E.	30 48 25	2954	29 17 15	2950	27 45 59	2945	26 14 37	2942
	α Aquilæ	E.	84 31 50	3299	83 7 37	3288	81 43 11	3277	80 18 33	3267
24	SUN	W.	107 58 32	3112	109 26 27	3095	110 54 43	3078	112 23 20	3060
	Regulus	W.	81 41 33	2777	83 16 31	2761	84 51 50	2744	86 27 31	2727
	VENUS	W.	69 52 29	3205	71 18 32	3187	72 44 57	3168	74 11 44	3149
	MARS	W.	65 15 22	2999	66 45 36	2981	68 16 12	2964	69 47 11	2945
	Spica	W.	27 42 4	2759	29 17 26	2742	30 53 10	2725	32 29 16	2708
	α Aquilæ	E.	73 12 32	3222	71 46 49	3214	70 20 57	3208	68 54 57	3201
25	SUN	W.	119 51 58	2969	121 22 50	2950	122 54 5	2931	124 25 44	2912
	Regulus	W.	94 31 39	2640	96 9 39	2623	97 48 3	2604	99 26 52	2587
	VENUS	W.	81 31 30	3051	83 0 40	3031	84 30 14	3011	86 0 13	2991
	MARS	W.	77 27 54	2852	79 1 14	2833	80 34 59	2814	82 9 9	2795
	Spica	W.	40 35 31	2621	42 13 57	2603	43 52 48	2585	45 32 3	2567
	α Aquilæ	E.	61 43 28	3187	60 17 3	3188	58 50 39	3190	57 24 18	3195
	Fomalhaut	E.	89 41 20	3091	88 12 59	3073	86 44 17	3056	85 15 14	3040
26	SUN	W.	132 9 55	2821	133 43 56	2802	135 18 21	2785	136 53 9	2767
	Regulus	W.	107 47 4	2497	109 28 21	2480	111 10 3	2462	112 52 9	2445
	VENUS	W.	93 36 28	2890	95 9 0	2870	96 41 57	2850	98 15 20	2831
	MARS	W.	90 6 15	2699	91 42 56	2680	93 20 3	2660	94 57 36	2642
	Spica	W.	53 54 37	2475	55 36 25	2458	57 18 38	2439	59 1 17	2422
	α Aquilæ	E.	50 15 1	3260	48 50 3	3284	47 25 33	3313	46 1 37	3348
	Fomalhaut	E.	77 45 24	2973	76 14 37	2962	74 43 36	2952	73 12 23	2943
27	VENUS	W.	106 8 35	2735	107 44 29	2717	109 20 46	2699	110 57 27	2681
	Spica	W.	67 40 54	2333	69 26 5	2316	71 11 41	2300	72 57 41	2283
	α Aquilæ	E.	39 14 29	3639	37 56 37	3731	36 40 23	3839	35 26 1	3964
	Fomalhaut	E.	65 34 7	2921	64 2 15	2922	62 30 24	2925	60 58 37	2931
	α Pegasi	E.	81 40 3	2483	79 58 26	2468	78 16 28	2453	76 34 9	2439
28	Spica	W.	81 53 33	2207	83 41 50	2193	85 30 28	2179	87 19 27	2167
	Antares	W.	36 42 53	2260	38 29 51	2243	40 17 15	2225	42 5 5	2209
	Fomalhaut	E.	53 22 40	3005	51 52 33	3031	50 22 59	3063	48 54 4	3101
	α Pegasi	E.	67 57 55	2380	66 13 52	2371	64 29 36	2363	62 45 8	2357
29	Spica	W.	96 29 0	2109	98 19 45	2099	100 10 45	2090	102 1 59	2083
	Antares	W.	51 9 53	2141	52 59 50	2130	54 50 3	2120	56 40 32	2110
	Fomalhaut	E.	41 43 43	3408	40 21 36	3503	39 1 15	3612	37 42 54	3739
	α Pegasi	E.	54 1 1	2343	52 16 4	2345	50 31 10	2350	48 46 23	2357
	α Arietis	E.	96 33 59	2153	94 44 20	2143	92 54 26	2134	91 4 19	2126
30	Antares	W.	65 56 16	2073	67 47 56	2068	69 39 44	2064	71 31 38	2061
	α Pegasi	E.	40 6 19	2438	38 23 38	2467	36 41 39	2502	35 0 29	2544
	α Arietis	E.	81 50 52	2095	79 59 45	2091	78 8 32	2088	76 17 14	2085
	Aldebaran	E.	114 58 59	2066	113 7 7	2061	111 15 8	2057	109 23 3	2053
31	Antares	W.	80 52 7	2055	82 44 16	2055	84 36 24	2057	86 28 29	2060
	α Arietis	E.	67 0 18	2087	65 8 59	2090	63 17 44	2093	61 26 34	2098
	Aldebaran	E.	100 1 38	2046	98 9 18	2049	96 17 0	2050	94 24 44	2053

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	8 46 3.75	9.704	N.17 59 46.8	−37.86	15 48.10	66.65	6 4.61	0.153
Wed.	2	8 49 56.34	9.680	17 44 29.3	38.60	15 48.23	66.56	6 0.67	0.177
Thur.	3	8 53 48.35	9.655	17 28 54.4	39.31	15 48.36	66.47	5 56.13	0.202
Frid.	4	8 57 39.76	9.631	17 13 2.4	−40.02	15 48.49	66.38	5 51.00	0.226
Sat.	5	9 1 30.59	9.607	16 56 53.5	40.71	15 48.63	66.30	5 45.29	0.250
SUN.	6	9 5 20.84	9.583	16 40 28.1	41.40	15 48.77	66.21	5 39.01	0.274
Mon.	7	9 9 10.51	9.558	16 23 46.4	−42.06	15 48.91	66.12	5 32.14	0.298
Tues.	8	9 12 59.61	9.534	16 6 48.8	42.72	15 49.05	66.03	5 24.70	0.322
Wed.	9	9 16 48.15	9.510	15 49 35.5	43.37	15 49.20	65.95	5 16.70	0.346
Thur.	10	9 20 36.12	9.487	15 32 7.1	−44.00	15 49.36	65.87	5 8.15	0.369
Frid.	11	9 24 23.54	9.464	15 14 23.7	44.61	15 49.52	65.79	4 59.03	0.392
Sat.	12	9 28 10.39	9.441	14 56 25.6	45.22	15 49.68	65.70	4 49.36	0.415
SUN.	13	9 31 56.70	9.418	14 38 13.1	−45.81	15 49.85	65.62	4 39.14	0.438
Mon.	14	9 35 42.47	9.396	14 19 46.7	46.39	15 50.03	65.54	4 28.38	0.460
Tues.	15	9 39 27.69	9.374	14 1 6.5	46.95	15 50.20	65.46	4 17.08	0.482
Wed.	16	9 43 12.38	9.352	13 42 12.9	−47.51	15 50.38	65.38	4 5.25	0.504
Thur.	17	9 46 56.54	9.330	13 23 6.3	48.03	15 50.57	65.30	3 52.89	0.526
Frid.	18	9 50 40.17	9.308	13 3 47.1	48.55	15 50.77	65.23	3 40.01	0.549
Sat.	19	9 54 23.29	9.286	12 44 15.5	−49.05	15 50.96	65.16	3 26.61	0.570
SUN.	20	9 58 5.92	9.266	12 24 32.0	49 56	15 51.16	65.09	3 12.72	0.590
Mon.	21	10 1 48.06	9.246	12 4 36.8	50.04	15 51.36	65.02	2 58.34	0.610
Tues.	22	10 5 29.72	9.226	11 44 30.1	−50.51	15 51.57	64.96	2 43.48	0.629
Wed.	23	10 9 10.91	9.207	11 24 12.3	50.96	15 51.78	64.89	2 28.16	0.648
Thur.	24	10 12 51.63	9.189	11 3 43.8	51.41	15 51.99	64.83	2 12.38	0.666
Frid.	25	10 16 31.93	9.171	10 43 4.9	−51.84	15 52.20	64.77	1 56.17	0.684
Sat.	26	10 20 11.82	9.153	10 22 15.8	52.25	15 52.42	64.71	1 39.55	0.702
SUN.	27	10 23 51.30	9.137	10 1 16.8	52.66	15 52.64	64.65	1 22.52	0.718
Mon.	28	10 27 30.39	9.121	9 40 8.3	−53.05	15 52.86	64.60	1 5.11	0.734
Tues.	29	10 31 9.13	9.107	9 18 50.4	53.43	15 53.08	64.55	0 47.34	0.748
Wed.	30	10 34 47.52	9.093	8 57 23.5	53.79	15 53.30	64.50	0 29.23	0.762
Thur.	31	10 38 25.59	9.080	8 35 48.1	54.15	15 53.52	64.45	0 10.80	0.775
Frid.	32	10 42 3.36	9.067	N. 8 14 4.4	−54.49	15 53.75	64.41	0 7.93	0.788

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

		THE SUN'S				Equation of Time, to be Subtracted from		
Day of the Week.	Day of the Month.	Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	8 46 2.76	9.704	N. 17 59 50.6	−37.86	6 4.62	0.153	8 39 58.14
Wed.	2	8 49 55.37	9.680	17 44 33.2	38.60	6 0.68	0.177	8 43 54.69
Thur.	3	8 53 47.39	9.655	17 28 58.3	39.31	5 56.14	0.202	8 47 51.25
Frid.	4	8 57 38.82	9.631	17 13 6.3	−40.02	5 51.02	0.226	8 51 47.80
Sat.	5	9 1 29.67	9.607	16 56 57.4	40.71	5 45.31	0.250	8 55 44.36
SUN.	6	9 5 19.94	9.583	16 40 32.0	41.40	5 39.03	0.274	8 59 40.91
Mon.	7	9 9 9.63	9.559	16 23 50.3	−42.06	5 32.16	0.298	9 3 37.47
Tues.	8	9 12 58.75	9.535	16 6 52.7	42.72	5 24.73	0.322	9 7 34.02
Wed.	9	9 16 47.31	9.511	15 49 39.4	43.37	5 16.73	0.346	9 11 30.58
Thur.	10	9 20 35.31	9.488	15 32 10.9	−44.00	5 8.18	0.369	9 15 27.13
Frid.	11	9 24 22.75	9.465	15 14 27.4	44.61	4 59.06	0.392	9 19 23.69
Sat.	12	9 28 9.63	9.442	14 56 29.2	45.22	4 49.39	0.415	9 23 20.24
SUN.	13	9 31 55.97	9.419	14 38 16.6	−45.81	4 39.17	0.438	9 27 16.80
Mon.	14	9 35 41.77	9.397	14 19 50.1	46.39	4 28.41	0.460	9 31 13.36
Tues.	15	9 39 27.02	9.375	14 1 9.8	46.95	4 17.11	0.482	9 35 9.91
Wed.	16	9 43 11.74	9.353	13 42 16.1	−47.51	4 5.28	0.504	9 39 6.46
Thur.	17	9 46 55.93	9.331	13 23 9.4	48.04	3 52.92	0.526	9 43 3.01
Frid.	18	9 50 39.60	9.308	13 3 50.1	48.56	3 40.04	0.549	9 46 59.56
Sat.	19	9 54 22.75	9.287	12 44 18.4	−49.06	3 26.64	0.570	9 50 56.11
SUN.	20	9 58 5.42	9.267	12 24 34.7	49.57	3 12.75	0.590	9 54 52.67
Mon.	21	10 1 47.60	9.247	12 4 39.3	50.05	2 58.37	0.610	9 58 49.23
Tues.	22	10 5 29.30	9.228	11 44 32.4	−50.52	2 43.52	0.629	10 2 45.78
Wed.	23	10 9 10.53	9.209	11 24 14.4	50.97	2 28.19	0.648	10 6 42.34
Thur.	24	10 12 51.29	9.191	11 3 45.7	51.42	2 12.40	0.666	10 10 38.89
Frid.	25	10 16 31.63	9.173	10 43 6.6	−51.85	1 56.19	0.684	10 14 35.44
Sat.	26	10 20 11.56	9.155	10 22 17.3	52.26	1 39.57	0.702	10 18 31.99
SUN.	27	10 23 51.08	9.139	10 1 18.1	52.67	1 22.54	0.718	10 22 28.54
Mon.	28	10 27 30.22	9.123	9 40 9.3	−53.06	1 5.12	0.734	10 26 25.10
Tues.	29	10 31 9.00	9.109	9 18 51.2	53.44	0 47.34	0.748	10 30 21.66
Wed.	30	10 34 47.44	9.095	8 57 24.1	53.80	0 29.23	0.762	10 34 18.21
Thur.	31	10 38 25.56	9.082	8 35 48.4	54.16	0 10.80	0.775	10 38 14.76
Frid.	32	10 42 3.38	9.069	N. 8 14 4.3	−54.50	0 7.93	0.788	10 42 11.31

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	213	129 4 51.2	4 6.0	143.53	+ 0.28	0.0063194	– 23.7	15 17 31.14
2	214	130 2 16.5	1 31.2	143.57	0.24	0.0062619	24.2	15 13 35.23
3	215	130 59 42.8	58 57.4	143.62	0.16	0.0062032	24.8	15 9 39.32
4	216	131 57 10.3	56 24.7	143.67	+ 0.08	0.0061430	– 25.4	15 5 43.41
5	217	132 54 39.1	53 53.4	143.72	– 0.04	0.0060813	26.0	15 1 47.50
6	218	133 52 9.3	51 23.5	143.78	0.17	0.0060182	26.7	14 57 51.59
7	219	134 49 40.8	48 54.9	143.83	– 0.30	0.0059534	– 27.4	14 53 55.69
8	220	135 47 13.6	46 27.5	143.89	0.44	0.0058866	28.2	14 49 59.78
9	221	136 44 47.7	44 1.5	143.95	0.57	0.0058178	29.0	14 46 3.87
10	222	137 42 23.3	41 37.0	144.01	– 0.67	0.0057470	– 29.9	14 42 7.95
11	223	138 40 0.3	39 13.9	144.07	0.77	0.0056742	30.8	14 38 12.05
12	224	139 37 38.5	36 52.0	144.12	0.83	0.0055993	31.7	14 34 16.14
13	225	140 35 18.0	34 31.4	144.18	– 0.87	0.0055222	– 32.6	14 30 20.23
14	226	141 32 59.0	32 12.2	144.23	0.87	0.0054429	33.5	14 26 24.32
15	227	142 30 41.1	29 54.2	144.28	0.85	0.0053612	34.4	14 22 28.41
16	228	143 28 24.5	27 37.5	144.33	– 0.81	0.0052774	– 35.3	14 18 32.50
17	229	144 26 9.1	25 22.0	144.38	0.72	0.0051916	36.1	14 14 36.59
18	230	145 23 54.9	23 7.7	144.43	0.63	0.0051039	36.9	14 10 40.68
19	231	146 21 41.9	20 54.5	144.48	– 0.50	0.0050143	– 37.7	14 6 44.79
20	232	147 19 30.0	18 42.5	144.53	0.37	0.0049230	38.4	14 2 48.88
21	233	148 17 19.2	16 31.6	144.58	0.24	0.0048301	39.0	13 58 52.97
22	234	149 15 9.6	14 21.9	144.63	– 0.10	0.0047356	– 39.6	13 54 57.06
23	235	150 13 1.1	12 13.3	144.68	+ 0.02	0.0046399	40.1	13 51 1.15
24	236	151 10 53.9	10 6.0	144.73	0.12	0.0045430	40.6	13 47 5.24
25	237	152 8 48.1	8 0.1	144.78	+ 0.21	0.0044451	– 41.0	13 43 9.33
26	238	153 6 43.6	5 55 5	144.83	0.27	0.0043463	41.3	13 39 13.42
27	239	154 4 40.5	3 52.3	144.89	0.29	0.0042468	41.6	13 35 17.52
28	240	155 2 38 8	1 50.5	144.95	+ 0.29	0.0041466	– 41.9	13 31 21.61
29	241	155 60 38.8	59 50.4	145.02	0.25	0.0040458	42.2	13 27 25.70
30	242	156 58 40.5	57 52.0	145.10	0.19	0.0039444	42.4	13 23 29.79
31	243	157 56 44.0	55 55.4	145.17	+ 0.09	0.0038423	42.7	13 19 33.90
32	244	158 54 49.2	54 0.5	145.25	– 0.01	0.0037396	– 42.9	13 15 37.99

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January 0^d.0.

Diff. for 1 Hour,
— 9^s.8296
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 36.8	16 35.2	60 51.7	−0.33	60 45.6	−0.67	14 15.0	2.24	17.2
2	16 32.5	16 28.9	60 35.8	0.97	60 22.6	1.23	15 8.3	2.21	18.2
3	16 24.5	16 19.5	60 6.5	1.45	59 48.1	1.61	16 1.3	2.21	19.2
4	16 14.0	16 8.2	59 28.0	−1.74	59 6.6	−1.83	16 54.4	2.22	20.2
5	16 2.2	15 56.1	58 44.4	1.87	58 22.0	1.86	17 48.0	2.23	21.2
6	15 50.0	15 44.0	57 59.6	1.84	57 37.6	1.80	18 41.9	2.24	22.2
7	15 38.2	15 32.6	57 16.3	−1.74	56 55.8	−1.67	19 35.6	2.23	23.2
8	15 27.2	15 22.2	56 36.2	1.59	56 17.7	1.49	20 28.5	2.18	24.2
9	15 17.5	15 13.0	56 0.3	1.40	55 44.0	1.31	21 20.0	2.10	25.2
10	15 8.9	15 5.1	55 28.8	−1.22	55 14.8	−1.12	22 9.3	2.01	26.2
11	15 1.6	14 58.4	55 1.9	1.03	54 50.1	0.93	22 56.4	1.91	27.2
12	14 55.5	14 52.9	54 39.5	0.84	54 30.0	0.74	23 41.4	1.83	28.2
13	14 50.6	14 48.7	54 21.7	−0.65	54 14.5	−0.55	☌		29.2
14	14 47.0	14 45.7	54 8.5	0.45	54 3.7	0.34	0 24.6	1.77	0.6
15	14 44.8	14 44.3	54 0.3	−0.23	53 58.3	−0.11	1 6.6	1.73	1.6
16	14 44.1	14 44.4	53 57.8	+0.03	53 59.0	+0.17	1 48.0	1.72	2.6
17	14 45.3	14 46.6	54 2.0	0.32	54 6.8	0.48	2 29.5	1.74	3.6
18	14 48.4	14 50.9	54 13.7	0.66	54 22.7	0.84	3 11.9	1.79	4.6
19	14 53.9	14 57.6	54 33.9	+1.02	54 47.3	+1.21	3 55.8	1.87	5.6
20	15 1.8	15 6.7	55 2.9	1.39	55 20.8	1.58	4 41.8	1.98	6.6
21	15 12.2	15 18.3	55 41.0	1.76	56 3.2	1.93	5 30.6	2.10	7.6
22	15 24.9	15 31.9	56 27.4	+2.09	56 53.3	+2.22	6 22.2	2.21	8.6
23	15 39.3	15 47.0	57 20.6	2.32	57 48.9	2.39	7 16.4	2.31	9.6
24	15 54.9	16 2.8	58 17.9	2.42	58 46.9	2.40	8 12.7	2.37	10.6
25	16 10.6	16 18.0	59 15.4	+2.33	59 42.6	+2.20	9 9.9	2.39	11.6
26	16 24.9	16 31.0	60 7.9	2.01	60 30.5	1.75	10 7.2	2.38	12.6
27	16 36.3	16 40.4	60 49.7	1.45	61 4.9	1.10	11 3.9	2.34	13.6
28	16 43.3	16 45.0	61 15.7	+0.70	61 21.6	+0.28	11 59.7	2.31	14.6
29	16 45.2	16 44.1	61 22.6	−0.13	61 18.6	−0.53	12 54.9	2.29	15.6
30	16 41.7	16 38.1	61 9.8	0.92	60 56.5	1.27	13 49.9	2.28	16.6
31	16 33.4	16 27.8	60 39.3	1.58	60 18.7	1.84	14 45.0	2.29	17.6
32	16 21.5	16 14.6	59 55.3	−2.04	59 30.0	−2.18	15 40.3	2.31	18.6

GREENWICH MEAN TIME

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 1.					**THURSDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 24 1.91	2.3481	S. 4 40 20.9	13.194	0	0 15 3.36	2.2926	N. 5 53 26.0	12.633
1	22 26 22.73	2.3461	4 27 8.5	13.218	1	0 17 20.91	2.2923	6 6 2.6	12.587
2	22 28 43.44	2.3442	4 13 54.7	13.242	2	0 19 38.44	2.2921	6 18 36.4	12.539
3	22 31 4.03	2.3422	4 0 39.5	13.263	3	0 21 55.96	2.2919	6 31 7.3	12.490
4	22 33 24.50	2.3402	3 47 23.1	13.283	4	0 24 13.47	2.2918	6 43 35.2	12.439
5	22 35 44.86	2.3383	3 34 5.5	13.302	5	0 26 30.98	2.2917	6 56 0.0	12.387
6	22 38 5.10	2.3364	3 20 46.8	13.319	6	0 28 48.48	2.2917	7 8 21.6	12.333
7	22 40 25.23	2.3347	3 7 27.2	13.334	7	0 31 5.98	2.2917	7 20 40.0	12.279
8	22 42 45.26	2.3329	2 54 6.7	13.347	8	0 33 23.48	2.2917	7 32 55.1	12.223
9	22 45 5.18	2.3312	2 40 45.5	13.359	9	0 35 40.99	2.2918	7 45 6.8	12.167
10	22 47 25.00	2.3295	2 27 23.6	13.370	10	0 37 58.50	2.2918	7 57 15.1	12.108
11	22 49 44.72	2.3278	2 14 1.1	13.379	11	0 40 16.01	2.2919	8 9 19.8	12.048
12	22 52 4.33	2.3261	2 0 38.1	13.387	12	0 42 33.53	2.2921	8 21 20.9	11.988
13	22 54 23.85	2.3245	1 47 14.7	13.392	13	0 44 51.06	2.2923	8 33 18.4	11.927
14	22 56 43.27	2.3229	1 33 51.1	13.395	14	0 47 8.60	2.2925	8 45 12.1	11.864
15	22 59 2.60	2.3214	1 20 27.3	13.397	15	0 49 26.16	2.2927	8 57 2.0	11.800
16	23 1 21.84	2.3199	1 7 3.4	13.398	16	0 51 43.73	2.2929	9 8 48.1	11.735
17	23 3 40.99	2.3184	0 53 39.5	13.397	17	0 54 1.31	2.2932	9 20 30.2	11.668
18	23 6 0.05	2.3170	0 40 15.7	13.395	18	0 56 18.91	2.2935	9 32 8.3	11.601
19	23 8 19.03	2.3157	0 26 52.1	13.392	19	0 58 36.53	2.2938	9 43 42.3	11.532
20	23 10 37.93	2.3143	0 13 28.7	13.387	20	1 0 54.17	2.2942	9 55 12.2	11.463
21	23 12 56.75	2.3130	S. 0 0 5.7	13.379	21	1 3 11.84	2.2947	10 6 37.9	11.392
22	23 15 15.49	2.3117	N. 0 13 16.8	13.371	22	1 5 29.53	2.2951	10 17 59.3	11.320
23	23 17 34.15	2.3104	N. 0 26 38.8	13.361	23	1 7 47.25	2.2955	N.10 29 16.3	11.247
	WEDNESDAY 2.					**FRIDAY 4.**			
0	23 19 52.74	2.3093	N. 0 40 0.1	13.349	0	1 10 4.99	2.2959	N.10 40 28.9	11.173
1	23 22 11.26	2.3082	0 53 20.7	13.336	1	1 12 22.76	2.2964	10 51 37.1	11.099
2	23 24 29.72	2.3071	1 6 40.4	13.321	2	1 14 40.56	2.2969	11 2 40.8	11.023
3	23 26 48.11	2.3060	1 19 59.2	13.305	3	1 16 58.39	2.2974	11 13 39.9	10.946
4	23 29 6.44	2.3050	1 33 17.0	13.287	4	1 19 16.25	2.2979	11 24 34.3	10.867
5	23 31 24.71	2.3039	1 46 33.7	13.268	5	1 21 34.14	2.2985	11 35 24.0	10.788
6	23 33 42.91	2.3029	1 59 49.2	13.247	6	1 23 52.07	2.2991	11 46 8.9	10.708
7	23 36 1.06	2.3021	2 13 3.4	13.225	7	1 26 10.03	2.2997	11 56 49.0	10.627
8	23 38 19.16	2.3012	2 26 16.2	13.202	8	1 28 28.03	2.3003	12 7 24.2	10.546
9	23 40 37.21	2.3004	2 39 27.6	13.177	9	1 30 46.06	2.3009	12 17 54.5	10.463
10	23 42 55.21	2.2996	2 52 37.5	13.151	10	1 33 4.14	2.3016	12 28 19.8	10.380
11	23 45 13.16	2.2988	3 5 45.7	13.123	11	1 35 22.25	2.3022	12 38 40.1	10.295
12	23 47 31.06	2.2980	3 18 52.2	13.093	12	1 37 40.40	2.3028	12 48 55.2	10.209
13	23 49 48.92	2.2974	3 31 56.9	13.062	13	1 39 58.59	2.3035	12 59 5.1	10.123
14	23 52 6.75	2.2968	3 44 59.7	13.031	14	1 42 16.82	2.3042	13 9 9.9	10.036
15	23 54 24.54	2.2962	3 58 0.6	12.998	15	1 44 35.09	2.3049	13 19 9.4	9.947
16	23 56 42.30	2.2957	4 10 59.4	12.963	16	1 46 53.41	2.3057	13 29 3.5	9.858
17	23 59 0.02	2.2951	4 23 56.1	12.926	17	1 49 11.77	2.3063	13 38 52.3	9.768
18	0 1 17.71	2.2946	4 36 50.5	12.888	18	1 51 30.17	2.3070	13 48 35.7	9.677
19	0 3 35.37	2.2942	4 49 42.6	12.849	19	1 53 48.61	2.3077	13 58 13.6	9.586
20	0 5 53.01	2.2938	5 2 32.4	12.809	20	1 56 7.10	2.3085	14 7 46.0	9.493
21	0 8 10.63	2.2934	5 15 19.7	12.767	21	1 58 25.63	2.3092	14 17 12.8	9.400
22	0 10 28.22	2.2931	5 28 4.5	12.724	22	2 0 44.20	2.3099	14 26 34.0	9.306
23	0 12 45.80	2.2928	5 40 46.6	12.679	23	2 3 2.82	2.3107	14 35 49.5	9.211
24	0 15 3.36	2.2926	N. 5 53 26.0	12.633	24	2 5 21.48	2.3114	N.14 44 59.3	9.116

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SATURDAY 5.					MONDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 5 21.48	2.3114	N.14 44 59.3	9.116	0	3 56 55.94	2.3286	N.20 0 43.6	3.866
1	2 7 40.19	2.3121	14 54 3.4	9.019	1	3 59 15.65	2.3282	20 4 32.0	3.747
2	2 9 58.94	2.3128	15 3 1.6	8.922	2	4 1 35.33	2.3277	20 8 13.3	3.629
3	2 12 17.73	2.3136	15 11 54.0	8.824	3	4 3 54.98	2.3272	20 11 47.5	3.512
4	2 14 36.57	2.3143	15 20 40.5	8.725	4	4 6 14.60	2.3267	20 15 14.7	3.394
5	2 16 55.45	2.3150	15 29 21.0	8.626	5	4 8 34.19	2.3262	20 18 34.8	3.276
6	2 19 14.37	2.3157	15 37 55.6	8.527	6	4 10 53.75	2.3257	20 21 47.8	3.157
7	2 21 33.34	2.3165	15 46 24.2	8.426	7	4 13 13.27	2.3250	20 24 53.7	3.039
8	2 23 52.35	2.3172	15 54 46.7	8.324	8	4 15 32.75	2.3243	20 27 52.5	2.921
9	2 26 11.40	2.3179	16 3 3.1	8.222	9	4 17 52.19	2.3236	20 30 44.2	2.802
10	2 28 30.49	2.3186	16 11 13.3	8.119	10	4 20 11.58	2.3228	20 33 28.8	2.684
11	2 30 49.63	2.3193	16 19 17.4	8.016	11	4 22 30.92	2.3219	20 36 6.3	2.565
12	2 33 8.81	2.3200	16 27 15.3	7.913	12	4 24 50.21	2.3211	20 38 36.6	2.447
13	2 35 28.03	2.3207	16 35 6.9	7.808	13	4 27 9.45	2.3202	20 40 59.9	2.329
14	2 37 47.29	2.3213	16 42 52.2	7.703	14	4 29 28.63	2.3192	20 43 16.1	2.210
15	2 40 6.58	2.3219	16 50 31.2	7.598	15	4 31 47.75	2.3182	20 45 25.1	2.091
16	2 42 25.91	2.3225	16 58 3.9	7.491	16	4 34 6.81	2.3171	20 47 27.0	1.973
17	2 44 45.28	2.3231	17 5 30.1	7.383	17	4 36 25.80	2.3160	20 49 21.9	1.856
18	2 47 4.68	2.3237	17 12 49.9	7.276	18	4 38 44.73	2.3148	20 51 9.7	1.737
19	2 49 24.12	2.3242	17 20 3.2	7.168	19	4 41 3.58	2.3136	20 52 50.4	1.619
20	2 51 43.59	2.3247	17 27 10.1	7.061	20	4 43 22.36	2.3123	20 54 24.0	1.502
21	2 54 3.09	2.3252	17 34 10.5	6.952	21	4 45 41.06	2.3110	20 55 50.6	1.384
22	2 56 22.62	2.3257	17 41 4.3	6.842	22	4 47 59.68	2.3097	20 57 10.1	1.267
23	2 58 42.18	2.3262	N.17 47 51.5	6.732	23	4 50 18.22	2.3083	N.20 58 22.6	1.149
	SUNDAY 6.					TUESDAY 8.			
0	3 1 1.77	2.3267	N.17 54 32.1	6.622	0	4 52 36.67	2.3068	N.20 59 28.0	1.032
1	3 3 21.38	2.3271	18 1 6.1	6.511	1	4 54 55.03	2.3053	21 0 26.4	0.915
2	3 5 41.02	2.3276	18 7 33.4	6.399	2	4 57 13.30	2.3038	21 1 17.8	0.797
3	3 8 0.69	2.3280	18 13 54.0	6.288	3	4 59 31.48	2.3022	21 2 2.1	0.680
4	3 10 20.38	2.3283	18 20 7.9	6.176	4	5 1 49.56	2.3005	21 2 39.4	0.564
5	3 12 40.09	2.3287	18 26 15.1	6.063	5	5 4 7.54	2.2988	21 3 9.8	0.449
6	3 14 59.82	2.3290	18 32 15.5	5.950	6	5 6 25.42	2.2971	21 3 33.3	0.333
7	3 17 19.57	2.3292	18 38 9.1	5.837	7	5 8 43.19	2.2953	21 3 49.8	0.217
8	3 19 39.33	2.3294	18 43 55.9	5.723	8	5 11 0.85	2.2934	21 3 59.3	+ 0.101
9	3 21 59.10	2.3296	18 49 35.9	5.609	9	5 13 18.40	2.2916	21 4 1.9	− 0.014
10	3 24 18.89	2.3298	18 55 9.0	5.494	10	5 15 35.84	2.2897	21 3 57.6	0.129
11	3 26 38.68	2.3299	19 0 35.2	5.380	11	5 17 53.16	2.2877	21 3 46.4	0.243
12	3 28 58.48	2.3301	19 5 54.6	5.266	12	5 20 10.36	2.2857	21 3 28.4	0.358
13	3 31 18.29	2.3302	19 11 7.1	5.150	13	5 22 27.44	2.2836	21 3 3.5	0.472
14	3 33 38.10	2.3302	19 16 12.6	5.034	14	5 24 44.39	2.2814	21 2 31.8	0.585
15	3 35 57.91	2.3302	19 21 11.2	4.918	15	5 27 1.21	2.2792	21 1 53.3	0.698
16	3 38 17.72	2.3302	19 26 2.8	4.802	16	5 29 17.90	2.2771	21 1 8.0	0.812
17	3 40 37.53	2.3302	19 30 47.4	4.686	17	5 31 34.46	2.2749	21 0 15.9	0.924
18	3 42 57.34	2.3301	19 35 25.1	4.570	18	5 33 50.89	2.2727	20 59 17.1	1.036
19	3 45 17.14	2.3299	19 39 55.8	4.453	19	5 36 7.18	2.2703	20 58 11.6	1.147
20	3 47 36.93	2.3297	19 44 19.4	4.335	20	5 38 23.33	2.2679	20 56 59.4	1.259
21	3 49 56.71	2.3295	19 48 36.0	4.218	21	5 40 39.33	2.2655	20 55 40.5	1.371
22	3 52 16.47	2.3292	19 52 45.6	4.101	22	5 42 55.19	2.2631	20 54 14.9	1.481
23	3 54 36.21	2.3289	19 56 48.1	3.984	23	5 45 10.90	2.2605	20 52 42.8	1.590
24	3 56 55.94	2.3286	N.20 0 43.6	3.866	24	5 47 26.45	2.2579	N.20 51 4.1	1.700

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 47 26.45	2.2579	N.20 51 4.1	1.700
1	5 49 41.85	2.2554	20 49 18.8	1.809
2	5 51 57.10	2.2528	20 47 27.0	1.917
3	5 54 12.19	2.2502	20 45 28.7	2.026
4	5 56 27.12	2.2475	20 43 23.9	2.134
5	5 58 41.89	2.2447	20 41 12.6	2.242
6	6 0 56.49	2.2419	20 38 54.9	2.348
7	6 3 10.92	2.2391	20 36 30.8	2.454
8	6 5 25.18	2.2362	20 34 0.4	2.560
9	6 7 39.27	2.2334	20 31 23.6	2.666
10	6 9 53.19	2.2306	20 28 40.5	2.770
11	6 12 6.94	2.2277	20 25 51.2	2.874
12	6 14 20.51	2.2247	20 22 55.6	2.978
13	6 16 33.90	2.2216	20 19 53.8	3.081
14	6 18 47.10	2.2185	20 16 45.9	3.184
15	6 21 0.12	2.2155	20 13 31.8	3.286
16	6 23 12.96	2.2124	20 10 11.6	3.387
17	6 25 25.61	2.2093	20 6 45.4	3.488
18	6 27 38.07	2.2061	20 3 13.1	3.588
19	6 29 50.34	2.2029	19 59 34.8	3.687
20	6 32 2.42	2.1997	19 55 50.6	3.786
21	6 34 14.31	2.1965	19 52 0.5	3.884
22	6 36 26.00	2.1932	19 48 4.5	3.982
23	6 38 37.49	2.1899	N.19 44 2.7	4.079

THURSDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 40 48.79	2.1866	N.19 39 55.0	4.176
1	6 42 59.89	2.1833	19 35 41.6	4.271
2	6 45 10.79	2.1799	19 31 22.5	4.366
3	6 47 21.48	2.1765	19 26 57.7	4.461
4	6 49 31.97	2.1732	19 22 27.2	4.556
5	6 51 42.26	2.1698	19 17 51.0	4.649
6	6 53 52.35	2.1664	19 13 9.3	4.741
7	6 56 2.23	2.1629	19 8 22.1	4.832
8	6 58 11.90	2.1595	19 3 29.4	4.923
9	7 0 21.37	2.1561	18 58 31.3	5.014
10	7 2 30.63	2.1525	18 53 27.7	5.104
11	7 4 39.67	2.1489	18 48 18.8	5.193
12	7 6 48.50	2.1454	18 43 4.6	5.281
13	7 8 57.12	2.1419	18 37 45.1	5.368
14	7 11 5.53	2.1384	18 32 20.4	5.455
15	7 13 13.73	2.1349	18 26 50.5	5.542
16	7 15 21.72	2.1313	18 21 15.4	5.628
17	7 17 29.49	2.1277	18 15 35.1	5.713
18	7 19 37.05	2.1242	18 9 49.8	5.797
19	7 21 44.39	2.1206	18 3 59.5	5.880
20	7 23 51.52	2.1171	17 58 4.2	5.962
21	7 25 58.44	2.1135	17 52 4.0	6.044
22	7 28 5.14	2.1099	17 45 58.9	6.125
23	7 30 11.63	2.1063	17 39 49.0	6.206
24	7 32 17.90	2.1027	N.17 33 34.2	6.287

FRIDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	7 32 17.90	2.1027	N.17 33 34.2	6.287
1	7 34 23.96	2.0992	17 27 14.6	6.366
2	7 36 29.80	2.0955	17 20 50.3	6.443
3	7 38 35.42	2.0919	17 14 21.4	6.520
4	7 40 40.83	2.0883	17 7 47.9	6.597
5	7 42 46.02	2.0847	17 1 9.8	6.673
6	7 44 50.99	2.0811	16 54 27.1	6.749
7	7 46 55.75	2.0776	16 47 39.9	6.823
8	7 49 0.30	2.0740	16 40 48.3	6.896
9	7 51 4.63	2.0704	16 33 52.3	6.969
10	7 53 8.75	2.0668	16 26 52.0	7.042
11	7 55 12.65	2.0632	16 19 47.3	7.114
12	7 57 16.34	2.0597	16 12 38.3	7.185
13	7 59 19.82	2.0562	16 5 25.1	7.254
14	8 1 23.08	2.0526	15 58 7.8	7.323
15	8 3 26.13	2.0491	15 50 46.3	7.392
16	8 5 28.97	2.0456	15 43 20.7	7.460
17	8 7 31.60	2.0421	15 35 51.1	7.527
18	8 9 34.02	2.0386	15 28 17.5	7.593
19	8 11 36.23	2.0351	15 20 39.9	7.658
20	8 13 38.23	2.0317	15 12 58.5	7.723
21	8 15 40.03	2.0282	15 5 13.2	7.787
22	8 17 41.62	2.0247	14 57 24.1	7.850
23	8 19 43.00	2.0213	N.14 49 31.2	7.912

SATURDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	8 21 44.18	2.0179	N.14 41 34.6	7.974
1	8 23 45.15	2.0145	14 33 34.3	8.035
2	8 25 45.92	2.0112	14 25 30.4	8.095
3	8 27 46.49	2.0078	14 17 22.9	8.154
4	8 29 46.86	2.0045	14 9 11.9	8.213
5	8 31 47.03	2.0012	14 0 57.4	8.271
6	8 33 47.00	1.9979	13 52 39.4	8.328
7	8 35 46.78	1.9946	13 44 18.0	8.384
8	8 37 46.36	1.9913	13 35 53.3	8.439
9	8 39 45.74	1.9881	13 27 25.3	8.494
10	8 41 44.93	1.9849	13 18 54.0	8.549
11	8 43 43.93	1.9817	13 10 19.4	8.602
12	8 45 42.74	1.9786	13 1 41.7	8.654
13	8 47 41.36	1.9754	12 53 0.9	8.706
14	8 49 39.79	1.9723	12 44 17.0	8.757
15	8 51 38.04	1.9693	12 35 30.0	8.807
16	8 53 36.11	1.9662	12 26 40.1	8.857
17	8 55 33.99	1.9632	12 17 47.2	8.906
18	8 57 31.69	1.9602	12 8 51.4	8.954
19	8 59 29.21	1.9572	11 59 52.7	9.002
20	9 1 26.55	1.9542	11 50 51.2	9.048
21	9 3 23.72	1.9513	11 41 47.0	9.093
22	9 5 20.71	1.9484	11 32 40.0	9.138
23	9 7 17.53	1.9456	11 23 30.4	9.183
24	9 9 14.18	1.9427	N.11 14 18.1	9.227

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SUNDAY 13.					TUESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 9 14.18	1.9427	N.11 14 18.1	9.227	0	10 39 52.98	1.8490	N. 3 14 44.2	10.492
1	9 11 10.66	1.9399	11 5 3.2	9.269	1	10 41 43.89	1.8480	3 4 14.4	10.502
2	9 13 6.97	1.9372	10 55 45.8	9.311	2	10 43 34.74	1.8471	2 53 44.0	10.511
3	9 15 3.12	1.9345	10 46 25.9	9.352	3	10 45 25.54	1.8462	2 43 13.1	10.520
4	9 16 59.11	1.9317	10 37 3.5	9.393	4	10 47 16.29	1.8454	2 32 41.6	10.528
5	9 18 54.93	1.9290	10 27 38.7	9.433	5	10 49 6.99	1.8447	2 22 9.7	10.535
6	9 20 50.59	1.9264	10 18 11.5	9.472	6	10 50 57.65	1.8439	2 11 37.4	10.542
7	9 22 46.10	1.9238	10 8 42.0	9.511	7	10 52 48.26	1.8432	2 1 4.7	10.548
8	9 24 41.45	1.9212	9 59 10.2	9.549	8	10 54 38.84	1.8426	1 50 31.7	10.553
9	9 26 36.64	1.9186	9 49 36.1	9.587	9	10 56 29.38	1.8420	1 39 58.3	10.558
10	9 28 31.68	1.9161	9 39 59.8	9.623	10	10 58 19.88	1.8414	1 29 24.7	10.563
11	9 30 26.57	1.9137	9 30 21.4	9.658	11	11 0 10.35	1.8409	1 18 50.8	10.567
12	9 32 21.32	1.9112	9 20 40.9	9.693	12	11 2 0.79	1.8404	1 8 16.7	10.569
13	9 34 15.92	1.9088	9 10 58.3	9.727	13	11 3 51.20	1.8400	0 57 42.5	10.572
14	9 36 10.38	1.9065	9 1 13.7	9.760	14	11 5 41.59	1.8397	0 47 8.1	10.574
15	9 38 4.70	1.9042	8 51 27.1	9.793	15	11 7 31.96	1.8393	0 36 33.6	10.575
16	9 39 58.88	1.9018	8 41 38.5	9.826	16	11 9 22.31	1.8391	0 25 59.1	10.575
17	9 41 52.92	1.8995	8 31 48.0	9.857	17	11 11 12.65	1.8388	0 15 24.6	10.575
18	9 43 46.82	1.8973	8 21 55.7	9.887	18	11 13 2.97	1.8386	N. 0 4 50.1	10.574
19	9 45 40.59	1.8951	8 12 1.6	9.917	19	11 14 53.28	1.8384	S. 0 5 44.3	10.573
20	9 47 34.23	1.8930	8 2 5.7	9.947	20	11 16 43.58	1.8383	0 16 18.6	10.571
21	9 49 27.75	1.8909	7 52 8.0	9.976	21	11 18 33.88	1.8382	0 26 52.8	10.568
22	9 51 21.14	1.8888	7 42 8.6	10.003	22	11 20 24.17	1.8382	0 37 26.8	10.565
23	9 53 14.41	1.8867	N. 7 32 7.6	10.030	23	11 22 14.47	1.8383	S. 0 48 0.6	10.562
	MONDAY 14.					WEDNESDAY 16.			
0	9 55 7.55	1.8847	N. 7 22 5.0	10.057	0	11 24 4.77	1.8384	S. 0 58 34.2	10.558
1	9 57 0.58	1.8828	7 12 0.8	10.082	1	11 25 55.08	1.8385	1 9 7.5	10.553
2	9 58 53.49	1.8808	7 1 55.1	10.107	2	11 27 45.39	1.8386	1 19 40.5	10.547
3	10 0 46.28	1.8789	6 51 47.9	10.132	3	11 29 35.71	1.8388	1 30 13.1	10.540
4	10 2 38.96	1.8771	6 41 39.2	10.156	4	11 31 26.05	1.8391	1 40 45.3	10.533
5	10 4 31.54	1.8754	6 31 29.2	10.179	5	11 33 16.41	1.8395	1 51 17.1	10.526
6	10 6 24.01	1.8737	6 21 17.8	10.202	6	11 35 6.79	1.8398	2 1 48.4	10.518
7	10 8 16.38	1.8719	6 11 5.0	10.224	7	11 36 57.19	1.8402	2 12 19.2	10.509
8	10 10 8.64	1.8702	6 0 50.9	10.245	8	11 38 47.62	1.8407	2 22 49.5	10.500
9	10 12 0.80	1.8685	5 50 35.6	10.265	9	11 40 38.07	1.8412	2 33 19.2	10.490
10	10 13 52.86	1.8669	5 40 19.1	10.284	10	11 42 28.56	1.8417	2 43 48.3	10.479
11	10 15 44.83	1.8654	5 30 1.5	10.303	11	11 44 19.08	1.8423	2 54 16.7	10.468
12	10 17 36.71	1.8639	5 19 42.8	10.321	12	11 46 9.64	1.8430	3 4 44.5	10.457
13	10 19 28.50	1.8624	5 9 23.0	10.339	13	11 48 0.24	1.8437	3 15 11.6	10.445
14	10 21 20.20	1.8610	4 59 2.1	10.357	14	11 49 50.88	1.8443	3 25 37.9	10.432
15	10 23 11.82	1.8596	4 48 40.2	10.373	15	11 51 41.56	1.8451	3 36 3.4	10.418
16	10 25 3.35	1.8583	4 38 17.3	10.389	16	11 53 32.29	1.8460	3 46 28.1	10.404
17	10 26 54.81	1.8570	4 27 53.5	10.404	17	11 55 23.08	1.8469	3 56 51.9	10.389
18	10 28 46.19	1.8557	4 17 28.8	10.419	18	11 57 13.92	1.8478	4 7 14.8	10.374
19	10 30 37.50	1.8545	4 7 3.2	10.433	19	11 59 4.81	1.8487	4 17 36.8	10.358
20	10 32 28.73	1.8533	3 56 36.8	10.446	20	12 0 55.76	1.8497	4 27 57.8	10.342
21	10 34 19.89	1.8521	3 46 9.7	10.458	21	12 2 46.78	1.8508	4 38 17.8	10.324
22	10 36 10.98	1.8510	3 35 41.9	10.469	22	12 4 37.86	1.8519	4 48 36.7	10.307
23	10 38 2.01	1.8500	3 25 13.4	10.481	23	12 6 29.01	1.8531	4 58 54.6	10.289
24	10 39 52.98	1.8490	N. 3 14 44.2	10.492	24	12 8 20.23	1.8543	S. 5 9 11.4	10.270

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 8 20.23	1.8543	S. 5 9 11.4	10.270
1	12 10 11.52	1.8555	5 19 27.0	10.250
2	12 12 2.89	1.8568	5 29 41.4	10.230
3	12 13 54.34	1.8582	5 39 54.6	10.209
4	12 15 45.87	1.8596	5 50 6.5	10.188
5	12 17 37.49	1.8610	6 0 17.1	10.166
6	12 19 29.19	1.8624	6 10 26.4	10.143
7	12 21 20.98	1.8640	6 20 34.3	10.120
8	12 23 12.87	1.8656	6 30 40.8	10.096
9	12 25 4.86	1.8672	6 40 45.8	10.072
10	12 26 56.94	1.8689	6 50 49.4	10.047
11	12 28 49.12	1.8706	7 0 51.4	10.021
12	12 30 41.41	1.8723	7 10 51.9	9.995
13	12 32 33.80	1.8741	7 20 50.8	9.968
14	12 34 26.30	1.8760	7 30 48.0	9.940
15	12 36 18.92	1.8779	7 40 43.6	9.912
16	12 38 11.65	1.8798	7 50 37.5	9.883
17	12 40 4.50	1.8818	8 0 29.6	9.853
18	12 41 57.47	1.8838	8 10 19.9	9.823
19	12 43 50.56	1.8859	8 20 8.3	9.792
20	12 45 43.78	1.8880	8 29 54.9	9.762
21	12 47 37.12	1.8902	8 39 39.7	9.731
22	12 49 30.60	1.8924	8 49 22.6	9.698
23	12 51 24.21	1.8947	S. 8 59 3.5	9.664

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 53 17.96	1.8970	S. 9 8 42.3	9.629
1	12 55 11.85	1.8993	9 18 19.0	9.595
2	12 57 5.88	1.9017	9 27 53.7	9.561
3	12 59 0.05	1.9041	9 37 26.3	9.525
4	13 0 54.37	1.9066	9 46 56.7	9.488
5	13 2 48.84	1.9092	9 56 24.9	9.451
6	13 4 43.47	1.9117	10 5 50.9	9.414
7	13 6 38.25	1.9143	10 15 14.6	9.376
8	13 8 33.19	1.9170	10 24 36.0	9.337
9	13 10 28.29	1.9197	10 33 55.0	9.297
10	13 12 23.55	1.9224	10 43 11.6	9.256
11	13 14 18.98	1.9251	10 52 25.7	9.215
12	13 16 14.57	1.9279	11 1 37.4	9.174
13	13 18 10.33	1.9308	11 10 46.6	9.132
14	13 20 6.27	1.9338	11 19 53.2	9.088
15	13 22 2.39	1.9367	11 28 57.2	9.044
16	13 23 58.68	1.9397	11 37 58.5	9.000
17	13 25 55.15	1.9428	11 46 57.2	8.956
18	13 27 51.81	1.9459	11 55 53.2	8.910
19	13 29 48.66	1.9490	12 4 46.4	8.863
20	13 31 45.69	1.9521	12 13 36.8	8.816
21	13 33 42.91	1.9552	12 22 24.4	8.769
22	13 35 40.32	1.9585	12 31 9.1	8.721
23	13 37 37.93	1.9618	12 39 50.9	8.672
24	13 39 35.74	1.9652	S. 12 48 29.7	8.622

SATURDAY 19

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 39 35.74	1.9652	S. 12 48 29.7	8.622
1	13 41 33.75	1.9685	12 57 5.5	8.572
2	13 43 31.96	1.9718	13 5 38.3	8.521
3	13 45 30.37	1.9752	13 14 8.0	8.468
4	13 47 28.99	1.9787	13 22 34.5	8.415
5	13 49 27.82	1.9822	13 30 57.8	8.362
6	13 51 26.86	1.9857	13 39 18.0	8.309
7	13 53 26.11	1.9893	13 47 34.9	8.254
8	13 55 25.58	1.9930	13 55 48.5	8.198
9	13 57 25.27	1.9967	14 3 58.7	8.142
10	13 59 25.18	2.0003	14 12 5.5	8.086
11	14 1 25.31	2.0040	14 20 9.0	8.029
12	14 3 25.66	2.0078	14 28 9.0	7.970
13	14 5 26.24	2.0116	14 36 5.4	7 911
14	14 7 27.05	2.0153	14 43 58.3	7.852
15	14 9 28.08	2.0191	14 51 47.6	7.792
16	14 11 29.34	2.0230	14 59 33.3	7.730
17	14 13 30.84	2.0270	15 7 15.2	7.667
18	14 15 32.58	2.0309	15 14 53.4	7.605
19	14 17 34.55	2.0348	15 22 27.8	7.542
20	14 19 36.76	2.0388	15 29 58.4	7.478
21	14 21 39.21	2.0428	15 37 25.1	7.413
22	14 23 41.90	2.0469	15 44 47.9	7.347
23	14 25 44.84	2.0510	S. 15 52 6.7	7.280

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 27 48.02	2.0551	S. 15 59 21.5	7.213
1	14 29 51.45	2.0592	16 6 32.3	7.146
2	14 31 55.13	2.0633	16 13 39.0	7.077
3	14 33 59.05	2.0675	16 20 41.5	7.007
4	14 36 3.23	2.0717	16 27 39.8	6.937
5	14 38 7.66	2.0760	16 34 33.9	6.866
6	14 40 12.35	2.0802	16 41 23.7	6.794
7	14 42 17.29	2.0845	16 48 9.1	6.721
8	14 44 22.49	2.0887	16 54 50.2	6.648
9	14 46 27.94	2.0930	17 1 26.9	6.574
10	14 48 33.65	2.0974	17 7 59.1	6.499
11	14 50 39.63	2.1018	17 14 26.8	6.423
12	14 52 45.87	2.1062	17 20 49.9	6.347
13	14 54 52.37	2.1105	17 27 8.4	6.269
14	14 56 59.13	2.1149	17 33 22.2	6.191
15	14 59 6.16	2.1193	17 39 31.3	6.112
16	15 1 13.45	2.1237	17 45 35.7	6.033
17	15 3 21.01	2.1282	17 51 35.3	5.952
18	15 5 28.84	2.1327	17 57 30.0	5.871
19	15 7 36.93	2.1371	18 3 19.8	5.789
20	15 9 45.29	2.1416	18 9 4.7	5.707
21	15 11 53.92	2.1461	18 14 44.6	5.623
22	15 14 2.82	2.1506	18 20 19.4	5.538
23	15 16 11.99	2.1550	18 25 49.2	5.453
24	15 18 21.42	2.1595	S. 18 31 13.8	5.367

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 18 21.42	2.1595	S.18 31 13.8	5.367
1	15 20 31.13	2.1641	18 36 33.2	5.280
2	15 22 41.11	2.1686	18 41 47.4	5.193
3	15 24 51.36	2.1731	18 46 56.4	5.105
4	15 27 1.88	2.1776	18 52 0.0	5.015
5	15 29 12.67	2.1821	18 56 58.2	4.925
6	15 31 23.73	2.1866	19 1 51.0	4.834
7	15 33 35.06	2.1911	19 6 38.3	4.742
8	15 35 46.66	2.1956	19 11 20.1	4.650
9	15 37 58.53	2.2002	19 15 56.3	4.557
10	15 40 10.68	2.2047	19 20 26.9	4.463
11	15 42 23.10	2.2092	19 24 51.9	4.369
12	15 44 35.79	2.2137	19 29 11.2	4.273
13	15 46 48.75	2.2182	19 33 24.7	4.177
14	15 49 1.97	2.2226	19 37 32.4	4.079
15	15 51 15.46	2.2271	19 41 34.2	3.981
16	15 53 29.22	2.2316	19 45 30.2	3.883
17	15 55 43.25	2.2361	19 49 20.2	3.783
18	15 57 57.55	2.2405	19 53 4.2	3.683
19	16 0 12.11	2.2449	19 56 42.2	3.582
20	16 2 26.94	2.2493	20 0 14.1	3.480
21	16 4 42.03	2.2537	20 3 39.8	3.377
22	16 6 57.38	2.2580	20 6 59.4	3.274
23	16 9 12.99	2.2624	S.20 10 12.7	3.170

TUESDAY 22

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 11 28.87	2.2668	S.20 13 19.8	3.066
1	16 13 45.01	2.2711	20 16 20.6	2.960
2	16 16 1.40	2.2753	20 19 15.0	2.854
3	16 18 18.05	2.2796	20 22 3.0	2.747
4	16 20 34.95	2.2838	20 24 44.6	2.639
5	16 22 52.11	2.2881	20 27 19.7	2.530
6	16 25 9.52	2.2923	20 29 48.2	2.421
7	16 27 27.18	2.2964	20 32 10.2	2.311
8	16 29 45.09	2.3006	20 34 25.5	2.200
9	16 32 3.25	2.3047	20 36 34.2	2.089
10	16 34 21.65	2.3087	20 38 36.2	1.978
11	16 36 40.29	2.3127	20 40 31.5	1.865
12	16 38 59.18	2.3167	20 42 20.0	1.751
13	16 41 18.30	2.3207	20 44 1.6	1.637
14	16 43 37.66	2.3247	20 45 36.4	1.522
15	16 45 57.26	2.3286	20 47 4.3	1.406
16	16 48 17.09	2.3324	20 48 25.2	1.290
17	16 50 37.15	2.3362	20 49 39.1	1.174
18	16 52 57.43	2.3399	20 50 46.1	1.057
19	16 55 17.94	2.3436	20 51 46.0	0.939
20	16 57 38.67	2.3473	20 52 38.8	0.820
21	16 59 59.62	2.3510	20 53 24.4	0.701
22	17 2 20.79	2.3546	20 54 2.9	0.582
23	17 4 42.17	2.3582	20 54 34.2	0.461
24	17 7 3.77	2.3617	S.20 54 58.2	0.340

WEDNESDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	17 7 3.77	2.3617	S.20 54 58.2	0.340
1	17 9 25.58	2.3652	20 55 15.0	0.219
2	17 11 47.59	2.3685	20 55 24.5	− 0.097
3	17 14 9.80	2.3718	20 55 26.6	+ 0.026
4	17 16 32.21	2.3751	20 55 21.4	0.149
5	17 18 54.82	2.3784	20 55 8.8	0.273
6	17 21 17.62	2.3816	20 54 48.7	0.397
7	17 23 40.61	2.3847	20 54 21.2	0.521
8	17 26 3.79	2.3878	20 53 46.2	0.646
9	17 28 27.15	2.3908	20 53 3.7	0.771
10	17 30 50.69	2.3938	20 52 13.7	0.896
11	17 33 14.41	2.3968	20 51 16.2	1.022
12	17 35 38.31	2.3997	20 50 11.1	1.149
13	17 38 2.38	2.4025	20 48 58.4	1.276
14	17 40 26.61	2.4053	20 47 38.0	1.403
15	17 42 51.01	2.4080	20 46 10.0	1.531
16	17 45 15.57	2.4106	20 44 34.3	1.659
17	17 47 40.28	2.4131	20 42 50.9	1.787
18	17 50 5.14	2.4156	20 40 59.8	1.916
19	17 52 30.15	2.4181	20 39 1.0	2.045
20	17 54 55.31	2.4205	20 36 54.4	2.174
21	17 57 20.61	2.4228	20 34 40.1	2.303
22	17 59 46.05	2.4251	20 32 18.0	2.433
23	18 2 11.62	2.4274	S.20 29 48.1	2.563

THURSDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	18 4 37.33	2.4296	S.20 27 10.5	2.693
1	18 7 3.17	2.4316	20 24 25.0	2.823
2	18 9 29.12	2.4335	20 21 31.7	2.953
3	18 11 55.19	2.4355	20 18 30.6	3.084
4	18 14 21.38	2.4374	20 15 21.6	3.215
5	18 16 47.68	2.4392	20 12 4.8	3.345
6	18 19 14.08	2.4409	20 8 40.2	3.476
7	18 21 40.59	2.4426	20 5 7.7	3.607
8	18 24 7.20	2.4443	20 1 27.4	3.738
9	18 26 33.90	2.4458	19 57 39.2	3.869
10	18 29 0.69	2.4473	19 53 43.1	4.001
11	18 31 27.57	2.4488	19 49 39.2	4.131
12	18 33 54.54	2.4502	19 45 27.4	4.262
13	18 36 21.59	2.4514	19 41 7.8	4.392
14	18 38 48.71	2.4526	19 36 40.3	4.523
15	18 41 15.90	2.4538	19 32 5.0	4.653
16	18 43 43.16	2.4549	19 27 21.9	4.784
17	18 46 10.49	2.4560	19 22 30.9	4.915
18	18 48 37.88	2.4569	19 17 32.1	5.045
19	18 51 5.32	2.4578	19 12 25.5	5.175
20	18 53 32.82	2.4587	19 7 11.1	5.304
21	18 56 0.37	2.4595	19 1 49.0	5.433
22	18 58 27.96	2.4603	18 56 19.1	5.562
23	19 0 55.60	2.4610	18 50 41.5	5.692
24	19 3 23.28	2.4616	S.18 44 56.1	5.821

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 25.					SUNDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 3 23.28	2.4616	S. 18 44 56.1	5.821	0	21 1 16.22	2.4352	S. 11 48 47.6	11.182
1	19 5 50.99	2.4621	18 39 3.0	5.949	1	21 3 42.30	2.4340	11 37 34.1	11.268
2	19 8 18.73	2.4626	18 33 2.2	6.077	2	21 6 8.30	2.4327	11 26 15.4	11.354
3	19 10 46.50	2.4630	18 26 53.8	6.204	3	21 8 34.22	2.4313	11 14 51.6	11.437
4	19 13 14.29	2.4633	18 20 37.7	6.331	4	21 11 0.06	2.4300	11 3 22.9	11.519
5	19 15 42.10	2.4637	18 14 14.0	6.457	5	21 13 25.82	2.4288	10 51 49.3	11.599
6	19 18 9.93	2.4640	18 7 42.8	6.583	6	21 15 51.51	2.4275	10 40 11.0	11.678
7	19 20 37.78	2.4642	18 1 4.0	6.710	7	21 18 17.12	2.4261	10 28 28.0	11.756
8	19 23 5.63	2.4643	17 54 17.6	6.836	8	21 20 42.65	2.4247	10 16 40.3	11.832
9	19 25 33.49	2.4644	17 47 23.7	6.960	9	21 23 8.09	2.4233	10 4 48.1	11.907
10	19 28 1.36	2.4644	17 40 22.4	7.084	10	21 25 33.45	2.4221	9 52 51.5	11.980
11	19 30 29.22	2.4643	17 33 13.6	7.208	11	21 27 58.74	2.4208	9 40 50.5	12.052
12	19 32 57.08	2.4642	17 25 57.4	7.331	12	21 30 23.95	2.4195	9 28 45.3	12.122
13	19 35 24.93	2.4642	17 18 33.9	7.454	13	21 32 49.08	2.4182	9 16 35.9	12.191
14	19 37 52.78	2.4641	17 11 3.0	7.576	14	21 35 14.13	2.4168	9 4 22.4	12.258
15	19 40 20.62	2.4638	17 3 24.8	7.697	15	21 37 39.10	2.4155	8 52 5.0	12.323
16	19 42 48.44	2.4635	16 55 39.4	7.817	16	21 40 3.99	2.4142	8 39 43.7	12.388
17	19 45 16.24	2.4632	16 47 46.8	7.937	17	21 42 28.80	2.4129	8 27 18.5	12.450
18	19 47 44.02	2.4628	16 39 47.0	8.056	18	21 44 53.54	2.4116	8 14 49.7	12.510
19	19 50 11.78	2.4624	16 31 40.1	8.174	19	21 47 18.20	2.4103	8 2 17.3	12.569
20	19 52 39.51	2.4619	16 23 26.1	8.292	20	21 49 42.78	2.4090	7 49 41.4	12.627
21	19 55 7.21	2.4614	16 15 5.0	8.409	21	21 52 7.28	2.4077	7 37 2.0	12.684
22	19 57 34.88	2.4608	16 6 37.0	8.524	22	21 54 31.70	2.4064	7 24 19.3	12.738
23	20 0 2.51	2.4603	S. 15 58 2.1	8.639	23	21 56 56.05	2.4052	S. 7 11 33.4	12.791
	SATURDAY 26.					MONDAY 28.			
0	20 2 30.11	2.4597	S. 15 49 20.3	8.754	0	21 59 20.32	2.4039	S. 6 58 44.4	12.843
1	20 4 57.67	2.4590	15 40 31.6	8.867	1	22 1 44.52	2.4027	6 45 52.3	12.892
2	20 7 25.19	2.4582	15 31 36.2	8.979	2	22 4 8.65	2.4015	6 32 57.4	12.938
3	20 9 52.66	2.4575	15 22 34.1	9.091	3	22 6 32.70	2.4003	6 19 59.7	12.984
4	20 12 20.09	2.4567	15 13 25.3	9.202	4	22 8 56.68	2.3991	6 6 59.3	13.029
5	20 14 47.47	2.4559	15 4 9.9	9.311	5	22 11 20.59	2.3979	5 53 56.2	13.072
6	20 17 14.80	2.4551	14 54 48.0	9.419	6	22 13 44.43	2.3967	5 40 50.6	13.113
7	20 19 42.08	2.4542	14 45 19.6	9.527	7	22 16 8.20	2.3956	5 27 42.6	13.152
8	20 22 9.30	2.4533	14 35 44.8	9.634	8	22 18 31.90	2.3945	5 14 32.3	13.190
9	20 24 36.47	2.4523	14 26 3.5	9.741	9	22 20 55.54	2.3934	5 1 19.8	13.226
10	20 27 3.58	2.4513	14 16 15.9	9.845	10	22 23 19.11	2.3923	4 48 5.2	13.260
11	20 29 30.63	2.4503	14 6 22.1	9.947	11	22 25 42.62	2.3912	4 34 48.6	13.293
12	20 31 57.62	2.4493	13 56 22.2	10.049	12	22 28 6.06	2.3902	4 21 30.0	13.325
13	20 34 24.55	2.4482	13 46 16.2	10.151	13	22 30 29.44	2.3892	4 8 9.6	13.353
14	20 36 51.41	2.4472	13 36 4.1	10.251	14	22 32 52.76	2.3882	3 54 47.6	13.380
15	20 39 18.21	2.4461	13 25 46.1	10.349	15	22 35 16.02	2.3872	3 41 24.0	13.406
16	20 41 44.94	2.4449	13 15 22.2	10.447	16	22 37 39.22	2.3862	3 27 58.9	13.430
17	20 44 11.60	2.4437	13 4 52.4	10.544	17	22 40 2.37	2.3853	3 14 32.4	13.452
18	20 46 38.19	2.4426	12 54 16.9	10.638	18	22 42 25.46	2.3844	3 1 4.6	13.473
19	20 49 4.71	2.4414	12 43 35.8	10.732	19	22 44 48.50	2.3835	2 47 35.6	13.492
20	20 51 31.16	2.4402	12 32 49.0	10.826	20	22 47 11.48	2.3826	2 34 5.6	13.508
21	20 53 57.54	2.4390	12 21 56.7	10.917	21	22 49 34.41	2.3818	2 20 34.6	13.523
22	20 56 23.84	2.4377	12 10 59.0	11.007	22	22 51 57.29	2.3810	2 7 2.8	13.537
23	20 58 50.07	2.4365	11 59 55.9	11.095	23	22 54 20.13	2.3802	1 53 30.2	13.549
24	21 1 16.22	2.4352	S. 11 48 47.6	11.182	24	22 56 42.92	2.3794	S. 1 39 56.9	13.559

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	22 56 42.92	2.3794	S. 1 39 56.9	13.559
1	22 59 5.66	2.3787	1 26 23.1	13.567
2	23 1 28.36	2.3780	1 12 48.8	13.574
3	23 3 51.02	2.3773	0 59 14.2	13.578
4	23 6 13.64	2.3767	0 45 39.4	13.582
5	23 8 36.22	2.3760	0 32 4.4	13.583
6	23 10 58.76	2.3754	0 18 29.4	13.582
7	23 13 21.27	2.3748	S. 0 4 54.5	13.580
8	23 15 43.74	2.3742	N. 0 8 40.2	13.577
9	23 18 6.18	2.3737	0 22 14.7	13.572
10	23 20 28.59	2.3732	0 35 48.8	13.564
11	23 22 50.97	2.3727	0 49 22.4	13.555
12	23 25 13.32	2.3723	1 2 55.4	13.544
13	23 27 35.65	2.3719	1 16 27.7	13.532
14	23 29 57.95	2.3715	1 29 59.2	13.518
15	23 32 20.23	2.3712	1 43 29.8	13.502
16	23 34 42.49	2.3708	1 56 59.4	13.484
17	23 37 4.73	2.3705	2 10 27.9	13.465
18	23 39 26.95	2.3702	2 23 55.2	13.444
19	23 41 49.16	2.3700	2 37 21.2	13.422
20	23 44 11.35	2.3698	2 50 45.8	13.398
21	23 46 33.53	2.3696	3 4 8.9	13.372
22	23 48 55.70	2.3694	3 17 30.4	13.344
23	23 51 17.86	2.3692	N. 3 30 50.2	13.314

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	23 53 40.00	2.3690	N. 3 44 8.1	13.283
1	23 56 2.14	2.3690	3 57 24.1	13.251
2	23 58 24.28	2.3689	4 10 38.2	13.217
3	0 0 46.41	2.3688	4 23 50.2	13.182
4	0 3 8.54	2.3688	4 37 0.0	13.144
5	0 5 30.67	2.3687	4 50 7.5	13.105
6	0 7 52.79	2.3687	5 3 12.6	13.065
7	0 10 14.92	2.3388	5 16 15.3	13.023
8	0 12 37.05	2.3689	5 29 15.4	12.979
9	0 14 59.19	2.3691	5 42 12.8	12.934
10	0 17 21.34	2.3692	5 55 7.5	12.887
11	0 19 43 49	2.3693	6 7 59.3	12.839
12	0 22 5.65	2.3694	6 20 48.2	12.790
13	0 24 27.82	2.3696	6 33 34.1	12.738
14	0 26 50.00	2.3698	6 46 16.8	12.685
15	0 29 12.20	2.3701	6 58 56.3	12.631
16	0 31 34.41	2.3703	7 11 32.5	12.576
17	0 33 56.63	2.3705	7 24 5.4	12.519
18	0 36 18.87	2.3708	7 36 34.8	12.460
19	0 38 41.13	2.3711	7 49 0.6	12.400
20	0 41 3.40	2.3714	8 1 22.8	12.339
21	0 43 25.69	2.3717	8 13 41 3	12.276
22	0 45 48.00	2.3721	8 25 55.9	12.211
23	0 48 10.34	2.3724	8 38 6.6	12.146
24	0 50 32.69	2.3727	N. 8 50 13.4	12.079

THURSDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 50 32.69	2.3727	N. 8 50 13.4	12.079
1	0 52 55.06	2.3731	9 2 16.1	12.011
2	0 55 17.46	2.3735	9 14 14.7	11.941
3	0 57 39.88	2.3739	9 26 9.0	11.869
4	1 0 2.33	2.3743	9 37 59.0	11.797
5	1 2 24.80	2.3747	9 49 44.7	11.725
6	1 4 47.29	2.3751	10 1 26.0	11.650
7	1 7 9.81	2.3756	10 13 2.7	11.573
8	1 9 32.36	2.3760	10 24 34.8	11.496
9	1 11 54.93	2.3764	10 36 2.2	11.417
10	1 14 17.53	2.3769	10 47 24.8	11.337
11	1 16 40.16	2.3774	10 58 42.7	11.257
12	1 19 2.82	2.3779	11 9 55.7	11.176
13	1 21 25.51	2.3783	11 21 3.8	11.092
14	1 23 48.22	2.3787	11 32 6.8	11.007
15	1 26 10.96	2.3792	11 43 4.6	10.920
16	1 28 33.73	2.3797	11 53 57.2	10.833
17	1 30 56.53	2.3802	12 4 44.6	10.746
18	1 33 19.36	2.3807	12 15 26.7	10.657
19	1 35 42.22	2.3812	12 26 3.5	10.567
20	1 38 5.11	2.3817	12 36 34.8	10.476
21	1 40 28.02	2.3821	12 47 0.6	10.383
22	1 42 50.96	2.3826	12 57 20.8	10.290
23	1 45 13.93	2.3830	N.13 7 35.4	10.197

FRIDAY, SEPTEMBER 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	1 47 36.92	2.3834	N.13 17 44.4	10.102

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter	5	16	13.6
● New Moon	13	9	10.0
☽ First Quarter . . .	21	12	54.8
○ Full Moon	28	9	18.9

	d	h
☾ Apogee.	15	21.5
☾ Perigee.	28	20.4

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III$^{\text{h}}$.	P. L. of Diff.	VI$^{\text{h}}$.	P. L. of Diff.	IX$^{\text{h}}$.	P. L. of Diff.
1	Antares	W.	88° 20′ 30″	2063	90° 12′ 26″	2066	92° 4′ 17″	2071	93° 56′ 1″	2076
	α Aquilæ	W.	41 46 25	3098	43 14 37	3030	44 44 12	2972	46 15 0	2921
	α Arietis	E.	59 35 31	2103	57 44 37	2109	55 53 52	2117	54 3 19	2125
	Aldebaran	E.	92 32 32	2056	90 40 25	2060	88 48 24	2064	86 56 29	2069
2	Antares	W.	103 12 22	2111	105 3 5	2120	106 53 34	2129	108 43 49	2139
	α Aquilæ	W.	54 2 41	2752	55 38 12	2731	57 14 11	2714	58 50 32	2700
	α Arietis	E.	44 54 10	2182	43 5 15	2197	41 16 43	2213	39 28 35	2231
	Saturn	E.	64 16 30	2111	62 25 48	2120	60 35 20	2130	58 45 6	2139
	Aldebaran	E.	77 39 11	2103	75 48 17	2112	73 57 36	2121	72 7 9	2130
	Jupiter	E.	91 50 2	2148	90 0 16	2156	88 10 42	2165	86 21 21	2174
3	α Aquilæ	W.	66 55 51	2667	68 33 15	2666	70 10 41	2666	71 48 6	2669
	Fomalhaut	W.	41 20 27	3401	42 42 42	3330	44 6 19	3268	45 31 8	3214
	Saturn	E.	49 37 43	2192	47 49 4	2204	46 0 43	2217	44 12 41	2229
	Aldebaran	E.	62 58 45	2185	61 9 55	2198	59 21 24	2210	57 33 11	2223
	Jupiter	E.	77 18 22	2227	75 30 35	2239	73 43 6	2251	71 55 54	2264
	Sun	E.	125 5 59	2487	123 24 28	2499	121 43 13	2511	120 2 15	2523
4	Fomalhaut	W.	52 48 22	3043	54 17 41	3023	55 47 25	3006	57 17 30	2992
	α Pegasi	W.	32 11 58	2812	33 46 10	2778	35 21 7	2750	36 56 41	2727
	Saturn	E.	35 17 20	2298	33 31 17	2313	31 45 36	2327	30 0 16	2342
	Aldebaran	E.	48 37 7	2293	46 50 57	2307	45 5 8	2323	43 19 42	2339
	Jupiter	E.	63 4 39	2329	61 19 22	2343	59 34 25	2357	57 49 48	2371
	Pollux	E.	91 1 3	2346	89 16 11	2360	87 31 39	2374	85 47 27	2388
	Sun	E.	111 41 53	2591	110 2 45	2604	108 23 56	2619	106 45 27	2633
5	Fomalhaut	W.	64 51 13	2959	66 22 17	2958	67 53 23	2958	69 24 29	2960
	α Pegasi	W.	45 0 0	2675	46 37 13	2674	48 14 28	2673	49 51 44	2674
	Aldebaran	E.	34 38 21	2422	32 55 18	2440	31 12 40	2459	29 30 29	2479
	Jupiter	E.	49 11 49	2442	47 29 14	2457	45 47 0	2471	44 5 6	2486
	Pollux	E.	77 11 36	2462	75 29 29	2477	73 47 44	2493	72 6 21	2509
	Sun	E.	98 37 58	2707	97 1 28	2723	95 25 19	2738	93 49 29	2753
6	Fomalhaut	W.	76 58 55	2985	78 29 27	2993	79 59 49	3001	81 30 1	3010
	α Pegasi	W.	57 57 16	2695	59 34 2	2701	61 10 40	2709	62 47 8	2716
	Jupiter	E.	35 40 41	2558	34 0 48	2572	32 21 15	2586	30 42 1	2601
	Pollux	E.	63 44 57	2589	62 5 47	2607	60 27 1	2624	58 48 38	2640
	Sun	E.	85 55 17	2828	84 21 25	2842	82 47 52	2857	81 14 38	2872
7	α Pegasi	W.	70 46 44	2761	72 22 3	2770	73 57 10	2780	75 32 4	2790
	α Arietis	W.	27 10 55	2805	28 45 16	2798	30 19 47	2793	31 54 25	2789
	Pollux	E.	50 42 37	2732	49 6 39	2750	47 31 6	2770	45 55 59	2792
	Sun	E.	73 33 8	2943	72 1 44	2958	70 30 38	2971	68 59 49	2984
8	α Arietis	W.	39 47 46	2798	41 22 16	2803	42 56 40	2808	44 30 57	2814
	Pollux	E.	38 7 34	2909	36 35 27	2938	35 3 56	2969	33 33 4	3002
	Sun	E.	61 29 52	3051	60 0 42	3063	58 31 47	3076	57 3 8	3088
9	α Arietis	W.	52 20 26	2845	53 53 55	2853	55 27 14	2860	57 0 24	2867
	Saturn	W.	31 37 30	2805	33 11 51	2815	34 46 0	2823	36 19 58	2831
	Aldebaran	W.	19 5 9	2892	20 37 38	2886	22 10 15	2883	23 42 56	2881
	Sun	E.	49 43 36	3148	48 16 25	3161	46 49 29	3173	45 22 47	3184

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Antares	W.	95° 47′ 37″	2082	97° 39′ 4″	2088	99° 30′ 21″	2096	101° 21′ 27″	2103
	α Aquilæ	W.	47 46 52	2876	49 19 41	2838	50 53 20	2805	52 27 42	2776
	α Arietis	E.	52 12 58	2134	50 22 51	2145	48 33 0	2156	46 43 26	2168
	Aldebaran	E.	85 4 42	2075	83 13 4	2081	81 21 35	2088	79 30 17	2096
2	Antares	W.	110 33 49	2149	112 23 34	2160	114 13 2	2171	116 2 13	2183
	α Aquilæ	W.	60 27 12	2689	62 4 7	2680	63 41 14	2673	65 18 30	2669
	α Arietis	E.	37 40 54	2251	35 53 42	2273	34 7 3	2298	32 21 0	2324
	SATURN	E.	56 55 6	2149	55 5 21	2159	53 15 52	2170	51 26 39	2181
	Aldebaran	E.	70 16 56	2141	68 26 59	2151	66 37 18	2162	64 47 53	2173
	JUPITER	E.	84 32 14	2184	82 43 22	2194	80 54 46	2205	79 6 26	2216
3	α Aquilæ	W.	73 25 27	2673	75 2 43	2678	76 39 52	2684	78 16 53	2692
	Fomalhaut	W.	46 57 0	3169	48 23 46	3130	49 51 19	3096	51 19 33	3068
	SATURN	E.	42 24 57	2243	40 37 33	2256	38 50 28	2270	37 3 44	2283
	Aldebaran	E.	55 45 18	2237	53 57 45	2250	52 10 32	2264	50 23 39	2278
	JUPITER	E.	70 9 1	2277	68 22 27	2289	66 36 12	2302	64 50 16	2315
	SUN	E.	118 21 34	2536	116 41 11	2549	115 1 6	2563	113 21 20	2577
4	Fomalhaut	W.	58 47 53	2981	60 18 30	2973	61 49 17	2966	63 20 12	2962
	α Pegasi	W.	38 32 45	2710	40 9 12	2697	41 45 56	2687	43 22 53	2680
	SATURN	E.	28 15 18	2358	26 30 43	2374	24 46 31	2391	23 2 43	2408
	Aldebaran	E.	41 34 39	2355	39 49 59	2371	38 5 42	2387	36 21 49	2405
	JUPITER	E.	56 5 32	2385	54 21 36	2399	52 38 0	2413	50 54 44	2428
	Pollux	E.	84 3 35	2403	82 20 4	2417	80 36 53	2432	78 54 4	2447
	SUN	E.	105 7 17	2649	103 29 28	2663	101 51 58	2678	100 14 48	2692
5	Fomalhaut	W.	70 55 32	2962	72 26 32	2967	73 57 26	2972	75 28 14	2977
	α Pegasi	W.	51 28 59	2676	53 6 11	2679	54 43 19	2684	56 20 21	2689
	Aldebaran	E.	27 48 46	2499	26 7 32	2522	24 26 49	2546	22 46 40	2573
	JUPITER	E.	42 23 33	2500	40 42 20	2515	39 1 27	2529	37 20 54	2543
	Pollux	E.	70 25 20	2525	68 44 41	2540	67 4 24	2556	65 24 29	2573
	SUN	E.	92 13 59	2768	90 38 49	2783	89 3 59	2798	87 29 28	2813
6	Fomalhaut	W.	83 0 1	3020	84 29 49	3030	85 59 24	3041	87 28 46	3053
	α Pegasi	W.	64 23 26	2725	65 59 33	2734	67 35 28	2742	69 11 12	2751
	JUPITER	E.	29 3 7	2615	27 24 33	2629	25 46 18	2644	24 8 23	2660
	Pollux	E.	57 10 38	2657	55 33 1	2675	53 55 48	2694	52 19 0	2713
	SUN	E.	79 41 43	2887	78 9 7	2901	76 36 49	2915	75 4 49	2930
7	α Pegasi	W.	77 6 45	2800	78 41 13	2810	80 15 28	2821	81 49 29	2831
	α Arietis	W.	33 29 7	2788	35 3 50	2789	36 38 32	2792	38 13 11	2795
	Pollux	E.	44 21 20	2813	42 47 9	2835	41 13 27	2859	39 40 15	2883
	SUN	E.	67 29 16	2997	65 59 0	3011	64 29 1	3024	62 59 18	3038
8	α Arietis	W.	46 5 7	2820	47 39 9	2826	49 13 3	2832	50 46 49	2839
	Pollux	E.	32 2 54	3038	30 33 29	3078	29 4 53	3124	27 37 13	3175
	SUN	E.	55 34 44	3101	54 6 35	3113	52 38 41	3124	51 11 1	3137
9	α Arietis	W.	58 33 25	2874	60 6 17	2881	61 39 0	2888	63 11 34	2896
	SATURN	W.	37 53 45	2840	39 27 21	2848	41 0 46	2857	42 34 0	2865
	Aldebaran	W.	25 15 39	2882	26 48 21	2884	28 21 0	2887	29 53 36	2891
	SUN	E.	43 56 19	3196	42 30 5	3208	41 4 5	3220	39 38 19	3231

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
10	α Arietis	W.	64° 43′ 58″	2903	66° 16′ 13″	2909	67° 48′ 20″	2916	69° 20′ 18″	2924
	Saturn	W.	44 7 4	2873	45 39 58	2881	47 12 41	2888	48 45 15	2896
	Aldebaran	W.	31 26 7	2894	32 58 33	2899	34 30 53	2905	36 3 6	2910
	Sun	E.	38 12 47	3243	36 47 29	3256	35 22 26	3268	33 57 37	3280
11	α Ariotis	W.	76 57 55	2058	78 29 1	2964	79 59 59	2971	81 30 48	2977
	Saturn	W.	56 25 40	2933	57 57 17	2939	59 28 46	2946	61 0 7	2952
	Aldebaran	W.	43 42 30	2937	45 14 2	2943	46 45 26	2949	48 16 43	2954
	Sun	E.	26 57 21	3351	25 34 9	3368	24 11 16	3387	22 48 45	3406
15	Sun	W.	18 23 50	3597	19 42 28	3580	21 1 24	3566	22 20 35	3555
	Spica	E.	41 56 5	3069	40 27 17	3071	38 58 32	3073	37 29 50	3075
	Antares	E.	87 28 52	3089	86 0 29	3091	84 32 9	3094	83 3 52	3096
16	Sun	W.	28 59 4	3519	30 19 7	3515	31 39 15	3510	32 59 28	3506
	Spica	E.	30 6 48	3082	28 38 16	3082	27 9 44	3082	25 41 12	3082
	Antares	E.	75 42 58	3103	74 14 52	3104	72 46 47	3105	71 18 43	3105
17	Sun	W.	39 41 40	3487	41 2 19	3482	42 23 3	3478	43 43 52	3473
	Antares	E.	63 58 21	3103	62 30 15	3101	61 2 7	3101	59 33 58	3099
	α Aquilæ	E.	114 38 22	3587	113 19 34	3575	112 0 32	3562	110 41 16	3549
18	Sun	W.	50 29 15	3448	51 50 37	3443	53 12 5	3436	54 33 41	3430
	Antares	E.	52 12 38	3087	50 44 13	3084	49 15 44	3081	47 47 11	3078
	α Aquilæ	E.	104 1 45	3496	102 41 16	3486	101 20 36	3477	99 59 46	3468
19	Sun	W.	61 23 39	3392	62 46 5	3383	64 8 41	3373	65 31 28	3364
	Mars	W.	27 15 12	3311	28 39 11	3297	30 3 26	3284	31 27 56	3271
	Antares	E.	40 23 23	3059	38 54 23	3055	37 25 18	3051	35 56 8	3047
	α Aquilæ	E.	93 13 4	3423	91 51 14	3415	90 29 15	3407	89 7 6	3399
20	Sun	W.	72 28 16	3310	73 52 16	3298	75 16 30	3286	76 40 58	3273
	Mars	W.	38 34 21	3204	40 0 26	3190	41 26 47	3177	42 53 24	3163
	Venus	W.	29 23 21	3383	30 45 57	3368	32 8 50	3353	33 32 0	3338
	Spica	W.	17 35 21	2937	19 6 53	2925	20 38 40	2913	22 10 42	2901
	α Aquilæ	E.	82 14 7	3360	80 51 5	3353	79 27 55	3346	78 4 37	3340
21	Sun	W.	83 47 14	3203	85 13 20	3188	86 39 44	3173	88 6 26	3156
	Mars	W.	50 10 49	3088	51 39 13	3073	53 7 56	3056	54 36 59	3044
	Venus	W.	40 32 17	3259	41 57 16	3243	43 22 34	3226	44 48 12	3209
	Spica	W.	29 54 48	2837	31 28 28	2823	33 2 26	2808	34 36 43	2794
	α Aquilæ	E.	71 6 20	3312	69 42 22	3307	68 18 19	3304	66 54 12	3300
22	Sun	W.	95 24 54	3072	96 53 38	3054	98 22 44	3036	99 52 12	3018
	Mars	W.	62 7 20	2955	63 38 29	2937	65 10 1	2919	66 41 56	2900
	Venus	W.	52 1 36	3119	53 29 22	3101	54 57 31	3081	56 26 4	3061
	Spica	W.	42 33 5	2715	44 9 25	2698	45 46 7	2682	47 23 11	2665
	α Aquilæ	E.	59 53 7	3301	58 28 57	3306	57 4 52	3312	55 40 54	3319
	Fomalhaut	E.	88 2 7	3184	86 35 39	3168	85 8 52	3154	83 41 48	3140
23	Sun	W.	107 25 21	2923	108 57 11	2903	110 29 26	2883	112 2 6	2864
	Mars	W.	74 27 31	2805	76 1 52	2785	77 36 39	2766	79 11 52	2746
	Venus	W.	63 54 52	2962	65 25 53	2942	66 57 19	2920	68 29 12	2900

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
10	α Arietis	W.	70° 52′ 7″	2931	72° 23′ 47″	2938	73° 55′ 18″	2944	75° 26′ 41″	2961
	Saturn	W.	50 17 39	2904	51 49 53	2911	53 21 58	2918	54 53 54	2926
	Aldebaran	W.	37 35 12	2915	39 7 12	2920	40 39 5	2926	42 10 51	2931
	Sun	E.	32 33 2	3294	31 8 43	3306	29 44 39	3320	28 20 51	3336
11	α Arietis	W.	83 1 29	2984	84 32 2	2990	86 2 27	2996	87 32 45	3002
	Saturn	W.	62 31 20	2959	64 2 24	2965	65 33 20	2972	67 4 8	2978
	Aldebaran	W.	49 47 53	2960	51 18 56	2965	52 49 52	2971	54 20 41	2977
	Sun	E.	21 26 37	3431	20 4 55	3457	18 43 43	3488	17 23 5	3525
15	Sun	W.	23 39 59	3545	24 59 33	3537	26 19 16	3530	27 39 7	3525
	Spica	E.	36 1 10	3077	34 32 32	3078	33 3 56	3079	31 35 21	3081
	Antares	E.	81 35 37	3098	80 7 25	3099	78 39 14	3101	77 11 5	3102
16	Sun	W.	34 19 46	3502	35 40 8	3498	37 0 34	3494	38 21 5	3490
	Spica	E.	24 12 41	3082	22 44 10	3082	21 15 38	3082	19 47 6	3080
	Antares	E.	69 50 39	3105	68 22 35	3105	66 54 31	3104	65 26 26	3104
17	Sun	W.	45 4 46	3469	46 25 45	3464	47 46 49	3459	49 7 59	3454
	Antares	E.	58 5 47	3097	56 37 34	3095	55 9 18	3093	53 41 0	3090
	α Aquilæ	E.	109 21 46	3537	108 2 3	3526	106 42 8	3516	105 22 2	3506
18	Sun	W.	55 55 24	3423	57 17 15	3415	58 39 14	3408	60 1 22	3400
	Antares	E.	46 18 35	3074	44 49 54	3070	43 21 8	3067	41 52 18	3063
	α Aquilæ	E.	98 38 46	3458	97 17 35	3449	95 56 14	3441	94 34 44	3432
19	Sun	W.	66 54 26	3353	68 17 36	3344	69 40 57	3333	71 4 30	3322
	Mars	W.	32 52 41	3258	34 17 42	3244	35 42 59	3231	37 8 32	3217
	Antares	E.	34 26 53	3043	32 57 34	3040	31 28 11	3038	29 58 45	3036
	α Aquilæ	E.	87 44 48	3391	86 22 21	3383	84 59 45	3375	83 37 0	3368
20	Sun	W.	78 5 41	3259	79 30 40	3246	80 55 55	3232	82 21 26	3218
	Mars	W.	44 20 18	3148	45 47 29	3133	47 14 58	3119	48 42 44	3104
	Venus	W.	34 55 28	3323	36 19 13	3307	37 43 16	3292	39 7 37	3276
	Spica	W.	23 42 59	2889	25 15 32	2876	26 48 21	2864	28 21 26	2851
	α Aquilæ	E.	76 41 12	3333	75 17 39	3327	73 53 59	3322	72 30 13	3316
21	Sun	W.	89 33 28	3139	91 0 50	3124	92 28 31	3107	93 56 32	3090
	Mars	W.	56 6 21	3024	57 36 4	3007	59 6 8	2990	60 36 33	2973
	Venus	W.	46 14 11	3192	47 40 30	3174	49 7 10	3156	50 34 12	3138
	Spica	W.	36 11 19	2779	37 46 15	2763	39 21 31	2748	40 57 7	2732
	α Aquilæ	E.	65 30 1	3299	64 5 48	3298	62 41 34	3298	61 17 20	3299
22	Sun	W.	101 22 3	2999	102 52 17	2981	104 22 54	2962	105 53 55	2942
	Mars	W.	68 14 15	2882	69 46 57	2862	71 20 4	2844	72 53 35	2825
	Venus	W.	57 55 1	3042	59 24 22	3022	60 54 7	3002	62 24 17	2982
	Spica	W.	49 0 38	2647	50 38 29	2629	52 16 44	2612	53 55 23	2594
	α Aquilæ	E.	54 17 4	3329	52 53 26	3342	51 30 3	3358	50 6 58	3377
	Fomalhaut	E.	82 14 27	3127	80 46 50	3114	79 18 56	3101	77 50 47	3088
23	Sun	W.	113 35 11	2845	115 8 41	2825	116 42 37	2805	118 16 59	2785
	Mars	W.	80 47 31	2726	82 23 36	2707	84 0 7	2687	85 37 5	2666
	Venus	W.	70 1 31	2879	71 34 17	2859	73 7 29	2838	74 41 8	2816

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Spica	W.	55° 34′ 26″	2576	57° 13′ 54″	2557	58° 53′ 48″	2538	60° 34′ 8″	2520
	Fomalhaut	E.	76 22 23	3078	74 53 46	3067	73 24 56	3057	71 55 54	3049
	α Pegasi	E.	93 19 3	2724	91 42 55	2706	90 6 23	2687	88 29 26	2669
24	Sun	W.	119 51 47	2765	121 27 1	2746	123 2 40	2726	124 38 45	2707
	Mars	W.	87 14 30	2646	88 52 22	2627	90 30 40	2607	92 9 25	2587
	Venus	W.	76 15 15	2795	77 49 49	2775	79 24 50	2754	81 0 18	2733
	Spica	W.	69 2 18	2425	70 45 17	2407	72 28 42	2388	74 12 34	2369
	Antares	W.	24 8 51	2550	25 48 55	2516	27 29 46	2485	29 11 20	2457
	Fomalhaut	E.	64 28 34	3024	62 58 51	3024	61 29 8	3026	59 59 27	3029
	α Pegasi	E.	80 18 32	2580	78 39 9	2562	76 59 22	2546	75 19 13	2530
25	Venus	W.	89 4 29	2632	90 42 41	2612	92 21 19	2593	94 0 23	2574
	Spica	W.	82 58 38	2277	84 45 11	2260	86 32 10	2242	88 19 35	2225
	Antares	W.	37 48 40	2333	39 33 52	2311	41 19 35	2290	43 5 49	2270
	Fomalhaut	E.	52 33 20	3093	51 5 2	3118	49 37 14	3147	48 10 1	3183
	α Pegasi	E.	66 53 2	2457	65 10 48	2445	63 28 17	2433	61 45 29	2422
	α Arietis	E.	109 54 40	2328	108 9 22	2310	106 23 37	2291	104 37 25	2274
26	Venus	W.	102 22 4	2486	104 3 37	2470	105 45 32	2455	107 27 49	2439
	Spica	W.	97 22 56	2144	99 12 48	2130	101 3 2	2115	102 53 38	2101
	Antares	W.	52 4 11	2178	53 53 12	2162	55 42 37	2146	57 32 26	2130
	Fomalhaut	E.	41 7 20	3480	39 46 34	3575	38 27 32	3685	37 10 29	3814
	α Pegasi	E.	53 8 13	2387	51 24 20	2386	49 40 25	2386	47 56 30	2389
	α Arietis	E.	95 40 0	2190	93 51 18	2175	92 2 13	2161	90 12 46	2147
27	Antares	W.	66 46 58	2066	68 38 50	2055	70 30 59	2044	72 23 24	2035
	α Arietis	E.	81 0 38	2088	79 9 20	2079	77 17 48	2070	75 26 2	2062
	Aldebaran	E.	114 8 52	2055	112 16 43	2044	110 24 17	2034	108 31 36	2025
28	Antares	W.	81 48 40	2001	83 42 13	1996	85 35 54	1992	87 29 41	1989
	α Aquilæ	W.	36 53 21	3356	38 16 28	3239	39 41 51	3137	41 9 16	3047
	α Arietis	E.	66 4 34	2035	64 11 54	2033	62 19 11	2031	60 26 25	2030
	Aldebaran	E.	99 4 58	1990	97 11 8	1986	95 17 12	1982	93 23 10	1979
29	Antares	W.	96 59 14	1987	98 53 8	1990	100 46 58	1994	102 40 42	1998
	α Aquilæ	W.	48 49 57	2742	50 25 41	2703	52 2 17	2668	53 39 40	2638
	α Arietis	E.	51 2 59	2045	49 10 35	2052	47 18 22	2061	45 26 22	2070
	Saturn	E.	71 35 18	1974	69 41 2	1975	67 46 49	1978	65 52 40	1982
	Aldebaran	E.	83 52 17	1977	81 58 7	1980	80 4 1	1982	78 9 59	1986
30	α Aquilæ	W.	61 54 59	2544	63 35 11	2535	65 15 36	2527	66 56 11	2522
	Fomalhaut	W.	37 6 43	3578	38 25 41	3457	39 46 53	3354	41 10 2	3265
	Saturn	E.	56 23 46	2011	54 30 29	2019	52 37 25	2028	50 44 35	2037
	Aldebaran	E.	68 41 41	2016	66 48 32	2025	64 55 36	2034	63 2 55	2044
	Jupiter	E.	87 34 15	2047	85 41 54	2055	83 49 46	2064	81 57 51	2073
31	α Aquilæ	W.	75 19 51	2527	77 0 26	2534	78 40 52	2542	80 21 7	2551
	Fomalhaut	W.	48 27 33	2979	49 58 12	2944	51 29 35	2915	53 1 35	2890
	Saturn	E.	41 24 24	2094	39 33 16	2108	37 42 29	2122	35 52 3	2136
	Aldebaran	E.	53 43 35	2102	51 52 39	2116	50 2 5	2131	48 11 53	2145
	Jupiter	E.	72 42 12	2130	70 51 58	2143	69 2 4	2155	67 12 29	2169
	Pollux	E.	96 6 51	2165	94 17 30	2177	92 28 27	2190	90 39 44	2203

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Spica	W.	62° 14′ 53″	2502	63° 56′ 4″	2482	65° 37′ 42″	2463	67° 19′ 47″	2445
	Fomalhaut	E.	70 26 42	3041	68 57 20	3034	67 27 50	3030	65 58 14	3026
	α Pegasi	E.	86 52 4	2650	85 14 17	2632	83 36 6	2615	81 57 31	2597
24	Sun	W.	126 15 15	2688	127 52 11	2669	129 29 32	2651	131 7 18	2632
	Mars	W.	93 48 38	2567	95 28 18	2548	97 8 24	2529	98 48 57	2510
	Venus	W.	82 36 14	2713	84 12 37	2692	85 49 27	2672	87 26 44	2652
	Spica	W.	75 56 53	2350	77 41 39	2332	79 26 52	2313	81 12 32	2296
	Antares	W.	30 53 34	2429	32 36 27	2404	34 19 56	2379	36 4 1	2355
	Fomalhaut	E.	58 29 50	3035	57 0 21	3045	55 31 4	3057	54 2 2	3073
	α Pegasi	E.	73 38 41	2514	71 57 47	2499	70 16 32	2485	68 34 57	2470
25	Venus	W.	95 39 53	2556	97 19 49	2538	99 0 10	2520	100 40 55	2503
	Spica	W.	90 7 26	2208	91 55 42	2192	93 44 22	2175	95 33 27	2159
	Antares	W.	44 52 33	2250	46 39 46	2231	48 27 27	2212	50 15 36	2195
	Fomalhaut	E.	46 43 31	3225	45 17 51	3274	43 53 9	3332	42 29 35	3401
	α Pegasi	E.	60 2 25	2412	58 19 8	2404	56 35 39	2397	54 52 0	2391
	α Arietis	E.	102 50 47	2256	101 3 43	2239	99 16 13	2223	97 28 19	2206
26	Venus	W.	109 10 28	2425	110 53 27	2410	112 36 47	2397	114 20 26	2384
	Spica	W.	104 44 36	2088	106 35 54	2075	108 27 32	2062	110 19 29	2052
	Antares	W.	59 22 39	2116	61 13 14	2103	63 4 9	2090	64 55 24	2077
	Fomalhaut	E.	35 55 41	3965	34 43 27	4143	33 34 7	4353	32 28 3	4601
	α Pegasi	E.	46 12 39	2394	44 28 55	2402	42 45 23	2413	41 2 7	2429
	α Arietis	E.	88 22 59	2134	86 32 52	2121	84 42 25	2109	82 51 40	2098
27	Antares	W.	74 16 3	2026	76 8 56	2019	78 2 0	2012	79 55 15	2006
	α Arietis	E.	73 34 4	2055	71 41 55	2048	69 49 36	2043	67 57 9	2038
	Aldebaran	E.	106 38 40	2016	104 45 31	2009	102 52 10	2002	100 58 39	1996
28	Antares	W.	89 23 32	1987	91 17 26	1986	93 11 22	1986	95 5 18	1986
	α Aquilæ	W.	42 38 30	2969	44 9 21	2901	45 41 39	2841	47 15 14	2788
	α Arietis	E.	58 33 38	2031	56 40 52	2033	54 48 9	2036	52 55 31	2040
	Aldebaran	E.	91 29 3	1977	89 34 53	1976	87 40 41	1976	85 46 29	1976
29	Antares	W.	104 34 20	2002	106 27 51	2007	108 21 14	2014	110 14 27	2021
	α Aquilæ	W.	55 17 43	2612	56 56 21	2590	58 35 30	2572	60 15 4	2556
	α Arietis	E.	43 34 37	2081	41 43 9	2094	39 52 1	2109	38 1 16	2126
	Saturn	E.	63 58 37	1986	62 4 41	1991	60 10 53	1997	58 17 14	2004
	Aldebaran	E.	76 16 3	1991	74 22 14	1996	72 28 33	2002	70 35 2	2009
30	α Aquilæ	W.	68 36 53	2520	70 17 39	2520	71 58 25	2520	73 39 10	2523
	Fomalhaut	W.	42 34 54	3189	44 1 16	3124	45 28 56	3068	46 57 45	3020
	Saturn	E.	48 51 59	2048	46 59 39	2059	45 7 36	2070	43 15 51	2082
	Aldebaran	E.	61 10 29	2054	59 18 19	2065	57 26 26	2077	55 34 51	2089
	Jupiter	E.	80 6 11	2083	78 14 46	2094	76 23 37	2105	74 32 45	2117
31	α Aquilæ	W.	82 1 10	2561	83 40 59	2572	85 20 32	2585	86 59 47	2599
	Fomalhaut	W.	54 34 7	2870	56 7 4	2854	57 40 22	2841	59 13 57	2831
	Saturn	E.	34 1 59	2151	32 12 18	2167	30 23 0	2182	28 34 6	2200
	Aldebaran	E.	46 22 3	2161	44 32 37	2177	42 43 35	2194	40 54 58	2211
	Jupiter	E.	65 23 15	2184	63 34 23	2198	61 45 53	2214	59 57 46	2230
	Pollux	E.	88 51 21	2218	87 3 20	2233	85 15 41	2248	83 28 25	2264

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	10 42 3.36	9.067	N. 8 14 4.4	-54.49	15 53.75	64.41	0 7.93	0.788
Sat.	2	10 45 40.85	9.056	7 52 12.7	54.82	15 53.98	64.37	0 26.94	0.799
SUN.	3	10 49 18.08	9.045	7 30 13.3	55.14	15 54.21	64.33	0 46.21	0.810
Mon.	4	10 52 55.05	9.035	7 8 6.4	-55.44	15 54.44	64.29	1 5.74	0.820
Tues.	5	10 56 31.78	9.026	6 45 52.5	55.73	15 54.67	64.25	1 25.50	0.829
Wed.	6	11 0 8.31	9.017	6 23 31.7	56.01	15 54.91	64.22	1 45.48	0.838
Thur.	7	11 3 44.66	9.010	6 1 4.5	-56.27	15 55.15	64.19	2 5.63	0.845
Frid.	8	11 7 20.83	9.004	5 38 31.2	56.51	15 55.39	64.16	2 25.95	0.851
Sat.	9	11 10 56.86	8.999	5 15 52.3	56.75	15 55.63	64.14	2 46.42	0.856
SUN.	10	11 14 32.76	8.994	4 53 7.9	-56.96	15 55.88	64.12	3 7.03	0.861
Mon.	11	11 18 8.54	8.989	4 30 18.5	57.15	15 56.13	64.10	3 27.75	0.866
Tues.	12	11 21 44.20	8.984	4 7 24.4	57.34	15 56.38	64.08	3 48.58	0.871
Wed.	13	11 25 19.76	8.980	3 44 26.0	-57.52	15 56.63	64.07	4 9.50	0.875
Thur.	14	11 28 55.25	8.978	3 21 23.5	57.68	15 56.89	64.06	4 30.51	0.877
Frid.	15	11 32 30.68	8.976	2 58 17.4	57.82	15 57.16	64.06	4 51.57	0.879
Sat.	16	11 36 6.07	8.975	2 35 7.9	-57.96	15 57.42	64.06	5 12.68	0.880
SUN.	17	11 39 41.43	8.974	2 11 55.5	58.07	15 57.69	64.05	5 33.81	0.881
Mon.	18	11 43 16.79	8.974	1 48 40.4	58.17	15 57.96	64.05	5 54.95	0.881
Tues.	19	11 46 52.15	8.975	1 25 23.2	-58.26	15 58.23	64.06	6 16.08	0.880
Wed.	20	11 50 27.55	8.977	1 2 4.0	58.33	15 58.50	64.07	6 37.19	0.878
Thur.	21	11 54 2.99	8.978	0 38 43.3	58.39	15 58.78	64.08	6 58.23	0.877
Frid.	22	11 57 38.51	8.982	N. 0 15 21.2	-58.43	15 59.05	64.10	7 19.21	0.874
Sat.	23	12 1 14.11	8.986	S. 0 8 1.8	58.47	15 59.33	64.12	7 40.09	0.869
SUN.	24	12 4 49.84	8.992	0 31 25.5	58.49	15 59.60	64.14	8 0.87	0.863
Mon.	25	12 8 25.69	8.997	0 54 49.4	-58.49	15 59.88	64.16	8 21.51	0.857
Tues.	26	12 12 1.71	9.005	1 18 13.4	58.49	16 0.15	64.19	8 41.99	0.850
Wed.	27	12 15 37.92	9.013	1 41 36.8	58.46	16 0.43	64.22	9 2.27	0.842
Thur.	28	12 19 14.33	9.023	2 4 59.7	-58.42	16 0.70	64.25	9 22.35	0.832
Frid.	29	12 22 50.99	9.032	2 28 21.5	58.37	16 0.97	64.29	9 42.20	0.823
Sat.	30	12 26 27.90	9.044	2 51 42.1	58.30	16 1.24	64.33	10 1.79	0.812
SUN.	31	12 30 5.10	9.056	S. 3 15 0.9	-58.23	16 1.52	64.38	10 21.10	0.799

NOTE.—The mean time of semidiameter passing may be found by subtracting 0ˢ.18 from the sidereal time. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	10 42 3.38	9.069	N. 8 14 4.3	-54.50	0 7.93	0.788	10 42 11.31
Sat.	2	10 45 40.92	9.058	7 52 12.3	54.83	0 26.95	0.799	10 46 7.87
Sun.	3	10 49 18.20	9.047	7 30 12.6	55 15	0 46.22	0.810	10 50 4.42
Mon.	4	10 52 55.22	9.037	7 8 5.4	-55.45	1 5.75	0.820	10 54 0.97
Tues.	5	10 56 32.00	9.028	6 45 51.1	55.74	1 25.52	0.829	10 57 57.52
Wed.	6	11 0 8.58	9.019	6 23 30.1	56.01	1 45.50	0.838	11 1 54.08
Thur.	7	11 3 44.98	9.012	6 1 2.6	-56.28	2 5.66	0.845	11 5 50.64
Frid.	8	11 7 21.20	9.006	5 38 29.0	56.52	2 25.98	0.851	11 9 47.18
Sat.	9	11 10 57.28	9.001	5 15 49.7	56.76	2 46.45	0.856	11 13 43.73
Sun.	10	11 14 33.22	8.996	4 53 5.0	-56.97	3 7.05	0.861	11 17 40.29
Mon.	11	11 18 9.06	8.991	4 30 15.2	57.17	3 27.78	0.866	11 21 36.84
Tues.	12	11 21 44.77	8.986	4 7 20.8	57.36	3 48.62	0.871	11 25 33.39
Wed.	13	11 25 20.38	8.982	3 44 22.0	-57.54	4 9.56	0.875	11 29 29.94
Thur.	14	11 28 55.92	8.980	3 21 19.2	57.70	4 30.57	0.877	11 33 26.49
Frid.	15	11 32 31.40	8.978	2 58 12.7	57.84	4 51.64	0.879	11 37 23.04
Sat.	16	11 36 6.85	8.977	2 35 2.9	-57.98	5 12.75	0.880	11 41 19.60
Sun.	17	11 39 42.26	8.976	2 11 50.1	58.09	5 33.89	0.881	11 45 16.15
Mon.	18	11 43 17.67	8.976	1 48 34.7	58.19	5 55.03	0.881	11 49 12.70
Tues.	19	11 46 53.08	8.977	1 25 17.1	-58.28	6 16.17	0.880	11 53 9.25
Wed.	20	11 50 28.53	8.979	1 1 57.6	58 35	6 37.28	0.878	11 57 5.81
Thur.	21	11 54 4.03	8.980	0 38 36.5	58.41	6 58.33	0.877	12 1 2.36
Frid.	22	11 57 39.60	8.984	N. 0 15 14.0	-58.45	7 19.31	0.874	12 4 58.91
Sat.	23	12 1 15.26	8.988	S. 0 8 9.3	58.49	7 40.20	0.869	12 8 55.46
Sun.	24	12 4 51.04	8.994	0 31 33.3	58.51	8 0.98	0.863	12 12 52.02
Mon.	25	12 8 26.95	8.999	0 54 57.6	-58.51	8 21.63	0.857	12 16 48.58
Tues.	26	12 12 3.02	9.007	1 18 21.9	58.51	8 42.11	0.850	12 20 45.13
Wed.	27	12 15 39.28	9.015	1 41 45.7	58.48	9 2.39	0.842	12 24 41.67
Thur.	28	12 19 15.74	9.025	2 5 8.9	-58.44	9 22.47	0.832	12 28 38.21
Frid.	29	12 22 52.45	9.036	2 28 31.0	58.39	9 42.32	0.823	12 32 34.77
Sat.	30	12 26 29.41	9.046	2 51 51.9	58.32	10 1.92	0 812	12 36 31.33
Sun.	31	12 30 6.65	9.058	S. 3 15 11.0	-58.26	10 21.23	0.799	12 40 27.88

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour,
$+ 9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE.						Mean Time of Sidereal Noon.
		λ	λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		° ′ ″	′ ″	″	″			h m s
1	244	158 54 49.2	54 0.5	145.25	– 0.01	0.0037396	– 42.9	13 15 37.99
2	245	159 52 56.2	52 7.4	145.33	0.13	0.0036363	43.2	13 11 42.08
3	246	160 51 5.1	50 16.2	145.42	0.26	0.0035322	43.5	13 7 46.17
4	247	161 49 16.1	48 27.1	145.50	– 0.40	0.0034273	– 43.9	13 3 50.27
5	248	162 47 29.0	46 39.9	145.58	0.53	0.0033213	44.4	12 59 54.36
6	249	163 45 43.9	44 54.7	145.66	0.63	0.0032142	44.8	12 55 58.45
7	250	164 44 0.9	43 11.7	145.75	– 0.73	0.0031060	– 45.3	12 52 2.54
8	251	165 42 20.0	41 30.8	145.83	0.80	0.0029967	45.8	12 48 6.64
9	252	166 40 41.2	39 51.8	145.92	0.85	0.0028860	46.4	12 44 10.73
10	253	167 39 4.3	38 14.8	146.00	– 0.85	0.0027739	– 47.0	12 40 14.82
11	254	168 37 29.4	36 39.8	146.08	0.84	0.0026604	47.6	12 36 18.92
12	255	169 35 56.4	35 6.7	146.16	0.79	0.0025455	48.1	12 32 23.02
13	256	170 34 25.4	33 35.6	146.25	– 0.73	0.0024292	– 48.7	12 28 27.11
14	257	171 32 56.2	32 6.3	146.33	0.64	0.0023116	49.2	12 24 31.20
15	258	172 31 28.8	30 38.8	146.40	0.52	0.0021926	49.8	12 20 35.29
16	259	173 30 3.1	29 13.0	146.47	– 0.38	0.0020724	– 50.3	12 16 39.39
17	260	174 28 39.2	27 49.0	146.54	0.24	0.0019511	50.7	12 12 43.48
18	261	175 27 16.9	26 26.7	146.61	– 0.10	0.0018288	51.1	12 8 47.57
19	262	176 25 56.4	25 6.1	146.67	+ 0.03	0.0017057	– 51.4	12 4 51.67
20	263	177 24 37.4	23 47.0	146.74	0.13	0.0015820	51.6	12 0 55.76
21	264	178 23 20.1	22 29.6	146.81	0.22	0.0014579	51.8	11 56 59.85
22	265	179 22 4.6	21 14.0	146.88	+ 0.27	0.0013335	– 51.9	11 53 3.94
23	266	180 20 50.7	20 0.0	146.96	0.31	0.0012089	51.9	11 49 8.03
24	267	181 19 38.6	18 47.8	147.03	0.32	0.0010843	51.9	11 45 12.13
25	268	182 18 28.4	17 37.5	147.11	+ 0.29	0.0009597	– 51.8	11 41 16.22
26	269	183 17 20.1	16 29.1	147.19	0.23	0.0008354	51.7	11 37 20.31
27	270	184 16 13.7	15 22.7	147.27	0.15	0.0007113	51.6	11 33 24.41
28	271	185 15 9.4	14 18.3	147.36	+ 0.03	0.0005875	– 51.5	11 29 28.50
29	272	186 14 7.1	13 15.9	147.45	– 0.09	0.0004641	51.3	11 25 32.60
30	273	187 13 7.0	12 15.7	147.54	0.22	0.0003411	51.2	11 21 36.69
31	274	188 12 9.1	11 17.7	147.63	– 0.35	0.0002184	– 51.1	11 17 40.79

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 21.5	16 14.6	59 55.3	−2.04	59 30.0	−2.18	15 40.3	2.31	18.6
2	16 7.3	15 59.9	59 3.3	2.26	58 36.0	2.29	16 35.7	2.30	19.6
3	15 52.4	15 45.1	58 8.6	2.28	57 41.6	2.22	17 30.8	2.28	20.6
4	15 37.9	15 31.2	57 15.5	−2.13	56 50.6	−2.02	18 24.8	2.22	21.6
5	15 24.8	15 18.8	56 27.1	1.89	56 5.2	1.75	19 17.0	2.13	22.6
6	15 13.3	15 8.3	55 45.0	1.61	55 26.6	1.46	20 7.0	2.03	23.6
7	15 3.8	14 59.7	55 10.0	−1.31	54 55.2	−1.16	20 54.5	1.93	24.6
8	14 56.2	14 53.1	54 42.2	1.01	54 30.9	0.87	21 39.8	1.85	25.6
9	14 50.5	14 48.4	54 21.3	0.72	54 13.4	0.60	22 23.3	1.79	26.6
10	14 46.6	14 45.2	54 6.9	−0.48	54 1.9	−0.36	23 5.6	1.74	27.6
11	14 44.3	14 43.7	53 58.3	0.23	53 56.2	−0.12	23 47.1	1.73	28.6
12	14 43.5	14 43.6	53 55.4	−0.01	53 55.9	+0.09	☌		29.6
13	14 44.1	14 44.9	53 57.6	+0.20	54 0.7	+0.30	0 28.7	1.74	0.9
14	14 46.1	14 47.8	54 5.2	0.43	54 11.2	0.56	1 10.8	1.78	1.9
15	14 49.8	14 52.3	54 18.8	0.69	54 27.9	0.83	1 54.2	1.84	2.9
16	14 55.3	14 58.7	54 38.7	+0.97	54 51.2	+1.11	2 39.3	1.93	3.9
17	15 2.6	15 6.9	55 5.5	1.26	55 21.6	1.42	3 26.6	2.03	4.9
18	15 11.8	15 17.2	55 39.6	1.58	55 59.4	1.72	4 16.3	2.12	5.9
19	15 23.1	15 29.5	56 20.9	+1.86	56 44.1	+1.99	5 8.1	2.20	6.9
20	15 36.1	15 43.1	57 8.7	2.11	57 34 6	2.20	6 1 8	2.27	7.9
21	15 50.4	15 57.9	58 1.4	2.26	58 28.8	2.29	6 56.6	2.30	8.9
22	16 5.4	16 12.7	58 56.2	+2.28	59 23.2	+2.21	7 51.9	2.30	9.9
23	16 19.7	16 26.3	59 49.0	2.09	60 13.0	1.91	8 47.1	2.30	10.9
24	16 32.1	16 37.1	60 34.5	1.67	60 52.9	1.38	9 42.2	2.29	11.9
25	16 41.1	16 43.8	61 7.4	+1.04	61 17.5	+0.65	10 37.2	2.30	12.9
26	16 45.3	16 45.4	61 22.9	+0.24	61 23.3	−0.18	11 32.5	2.32	13.9
27	16 44.2	16 41.6	61 18.7	−0.59	61 9.2	0.99	12 28.4	2.35	14.9
28	16 37.7	16 32.7	60 55.0	−1.36	60 36.7	−1.69	13 25.2	2.38	15.9
29	16 26.7	16 20.0	60 14.7	1.96	59 49.8	2.18	14 22.6	2.39	16.9
30	16 12.6	16 4.8	59 22.7	2.32	58 54.2	2.41	15 19.9	2.37	17.9
31	15 56.9	15 48.9	58 25.0	−2.45	57 55.7	−2.43	16 16.2	2.31	18.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 1.					SUNDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 47 36.92	2.3834	N.13 17 44.4	10.102	0	3 42 12.30	2.3802	N.19 18 23.0	4.714
1	1 49 59.94	2.3839	13 27 47.6	10.005	1	3 44 35.09	2.3793	19 23 2.2	4.592
2	1 52 22.99	2.3844	13 37 45.0	9.908	2	3 46 57.82	2.3784	19 27 34.0	4.469
3	1 54 46.07	2.3848	13 47 36.6	9.811	3	3 49 20.50	2.3774	19 31 58.5	4.347
4	1 57 9.17	2.3852	13 57 22.3	9.712	4	3 51 43.11	2.3763	19 36 15.6	4.224
5	1 59 32.29	2.3856	14 7 2.0	9.612	5	3 54 5.66	2.3752	19 40 25.4	4.102
6	2 1 55.44	2.3860	14 16 35.7	9.511	6	3 56 28.14	2.3741	19 44 27.9	3.980
7	2 4 18.61	2.3863	14 26 3.3	9.409	7	3 58 50.55	2.3729	19 48 23.0	3.857
8	2 6 41.80	2.3867	14 35 24.8	9.307	8	4 1 12.89	2.3717	19 52 10.7	3.734
9	2 9 5.02	2.3871	14 44 40.1	9.203	9	4 3 35.16	2.3705	19 55 51.1	3.612
10	2 11 28.26	2.3875	14 53 49.2	9.099	10	4 5 57.35	2.3692	19 59 24.1	3.489
11	2 13 51.52	2.3878	15 2 52.0	8.994	11	4 8 19.46	2.3678	20 2 49.8	3.366
12	2 16 14.79	2.3680	15 11 48.5	8.888	12	4 10 41.48	2.3664	20 6 8.1	3.243
13	2 18 38.08	2.3883	15 20 38.6	8.782	13	4 13 3.42	2.3649	20 9 19.0	3.121
14	2 21 1.39	2.3886	15 29 22.3	8.675	14	4 15 25.27	2.3633	20 12 22.6	2.999
15	2 23 24.72	2.3889	15 37 59.6	8.567	15	4 17 47.02	2.3617	20 15 18.9	2.876
16	2 25 48.06	2.3891	15 46 30.4	8.458	16	4 20 8.68	2.3602	20 18 7.8	2.754
17	2 28 11.41	2.3893	15 54 54.6	8.349	17	4 22 30.24	2.3586	20 20 49.4	2.633
18	2 30 34.77	2.3894	16 3 12.3	8.239	18	4 24 51.71	2.3569	20 23 23.7	2.511
19	2 32 58.14	2.3896	16 11 23.3	8.128	19	4 27 13.07	2.3552	20 25 50.7	2.388
20	2 35 21.52	2.3897	16 19 27.7	8.017	20	4 29 34.33	2.3534	20 28 10.3	2.266
21	2 37 44.91	2.3899	16 27 25.4	7.905	21	4 31 55.48	2.3515	20 30 22.6	2.144
22	2 40 8.31	2.3900	16 35 16.3	7.793	22	4 34 16.51	2.3496	20 32 27.6	2.023
23	2 42 31.71	2.3900	N.16 43 0.5	7.680	23	4 36 37.43	2.3477	N.20 34 25.4	1.902
	SATURDAY 2.					MONDAY 4.			
0	2 44 55.11	2.3900	N.16 50 37.9	7.566	0	4 38 58.24	2.3458	N.20 36 15.9	1.782
1	2 47 18.51	2.3900	16 58 8.4	7.452	1	4 41 18.93	2.3438	20 37 59.2	1.661
2	2 49 41.91	2.3900	17 5 32.1	7.337	2	4 43 39.49	2.3417	20 39 35.2	1.540
3	2 52 5.31	2.3899	17 12 48.9	7.222	3	4 45 59.93	2.3396	20 41 4.0	1.420
4	2 54 28.70	2.3898	17 19 58.7	7.106	4	4 48 20.24	2.3374	20 42 25.6	1.300
5	2 56 52.08	2.3897	17 27 1.6	6.990	5	4 50 40.42	2.3352	20 43 40.0	1.180
6	2 59 15.46	2.3896	17 33 57.5	6.873	6	4 53 0.46	2.3329	20 44 47.2	1.061
7	3 1 38.83	2.3894	17 40 46.4	6.756	7	4 55 20.37	2.3306	20 45 47.3	0.942
8	3 4 2.19	2.3892	17 47 28.2	6.639	8	4 57 40.14	2.3283	20 46 40.2	0.823
9	3 6 25.53	2.3889	17 54 3.0	6.521	9	4 59 59.77	2.3259	20 47 26.0	0.704
10	3 8 48.85	2.3885	18 0 30.7	6.402	10	5 2 19.25	2.3235	20 48 4.7	0.587
11	3 11 12.15	2.3882	18 6 51.3	6.283	11	5 4 38.59	2.3211	20 48 36.4	0.469
12	3 13 35.43	2.3878	18 13 4.7	6.164	12	5 6 57.78	2.3185	20 49 1.0	0.352
13	3 15 58.69	2.3874	18 19 11.0	6.045	13	5 9 16.81	2.3159	20 49 18.6	0.235
14	3 18 21.92	2.3870	18 25 10.1	5.926	14	5 11 35.69	2.3134	20 49 29.2	0.118
15	3 20 45.13	2.3866	18 31 2.1	5.806	15	5 13 54.42	2.3108	20 49 32.8	+ 0.002
16	3 23 8.31	2.3860	18 36 46.8	5.685	16	5 16 12.99	2.3081	20 49 29.4	− 0.115
17	3 25 31.45	2.3853	18 42 24.3	5.564	17	5 18 31.39	2.3053	20 49 19.0	0.231
18	3 27 54.55	2.3847	18 47 54.5	5.443	18	5 20 49.63	2.3026	20 49 1.7	0.345
19	3 30 17.62	2.3841	18 53 17.5	5.322	19	5 23 7.70	2.2998	20 48 37.6	0.459
20	3 32 40.65	2.3834	18 58 33.2	5.201	20	5 25 25.60	2.2970	20 48 6.6	0.574
21	3 35 3.63	2.3827	19 3 41.6	5.079	21	5 27 43.34	2.2942	20 47 28.7	0.688
22	3 37 26.57	2.3819	19 8 42.7	4.957	22	5 30 0.90	2.2912	20 46 44.0	0.801
23	3 39 49.46	2.3811	19 13 36.5	4.836	23	5 32 18.28	2.2882	20 45 52.6	0.913
24	3 42 12.30	2.3802	N.19 18 23.0	4.714	24	5 34 35.48	2.2852	N.20 44 54.4	1.026

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 5.					**THURSDAY 7.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 34 35.48	2.2852	N.20 44 54.4	1.026	0	7 20 20.32	2.1147	N.17 57 15.9	5.713
1	5 36 52.50	2.2822	20 43 49.5	1.138	1	7 22 27.09	2.1109	17 51 30.7	5.794
2	5 39 9.34	2.2792	20 42 37.9	1.249	2	7 24 33.63	2.1071	17 45 40.6	5.875
3	5 41 26.00	2.2761	20 41 19.6	1.360	3	7 26 39.94	2.1033	17 39 45.7	5.954
4	5 43 42.47	2.2729	20 39 54.7	1.470	4	7 28 46.03	2.0996	17 33 46.1	6.033
5	5 45 58.75	2.2698	20 38 23.2	1.579	5	7 30 51.89	2.0958	17 27 41.8	6.111
6	5 48 14.84	2.2666	20 36 45.2	1.688	6	7 32 57.53	2.0921	17 21 32.8	6.188
7	5 50 30.74	2.2633	20 35 0.6	1.797	7	7 35 2.94	2.0883	17 15 19.2	6.265
8	5 52 46.44	2.2601	20 33 9.5	1.905	8	7 37 8.13	2.0846	17 9 1.0	6.342
9	5 55 1.95	2.2568	20 31 12.0	2.013	9	7 39 13.10	2.0809	17 2 38.2	6.418
10	5 57 17.26	2.2535	20 29 8.0	2.120	10	7 41 17.84	2.0772	16 56 10.9	6.493
11	5 59 32.37	2.2502	20 26 57.6	2.226	11	7 43 22.36	2.0735	16 49 39.1	6.567
12	6 1 47.29	2.2469	20 24 40.9	2.332	12	7 45 26.66	2.0698	16 43 2.9	6.639
13	6 4 2.00	2.2435	20 22 17.8	2.437	13	7 47 30.74	2.0662	16 36 22.4	6.711
14	6 6 16.51	2.2401	20 19 48.4	2.542	14	7 49 34.60	2.0625	16 29 37.6	6.783
15	6 8 30.81	2.2366	20 17 12.8	2.646	15	7 51 38.24	2.0588	16 22 48.4	6.855
16	6 10 44.90	2.2331	20 14 30.9	2.750	16	7 53 41.66	2.0552	16 15 55.0	6.925
17	6 12 58.78	2.2296	20 11 42.8	2.852	17	7 55 44.87	2.0516	16 8 57.4	6.994
18	6 15 12.45	2.2261	20 8 48.6	2.954	18	7 57 47.86	2.0480	16 1 55.7	7.063
19	6 17 25.91	2.2226	20 5 48.3	3.056	19	7 59 50.63	2.0444	15 54 49.9	7.131
20	6 19 39.16	2.2190	20 2 41.9	3.157	20	8 1 53.19	2.0408	15 47 40.0	7.199
21	6 21 52.19	2.2154	19 59 29.4	3.257	21	8 3 55.54	2.0373	15 40 26.0	7.266
22	6 24 5.01	2.2118	19 56 11.0	3.357	22	8 5 57.67	2.0337	15 33 8.1	7.332
23	6 26 17.61	2.2083	N.19 52 46.6	3.456	23	8 7 59.59	2.0302	N.15 25 46.2	7.397
WEDNESDAY 6.					**FRIDAY 8.**				
0	6 28 30.00	2.2047	N.19 49 16.3	3.554	0	8 10 1.30	2.0267	N.15 18 20.4	7.462
1	6 30 42.17	2.2010	19 45 40.1	3.652	1	8 12 2.80	2.0233	15 10 50.8	7.525
2	6 32 54.12	2.1973	19 41 58.0	3.750	2	8 14 4.10	2.0199	15 3 17.4	7.588
3	6 35 5.85	2.1937	19 38 10.1	3.847	3	8 16 5.19	2.0164	14 55 40.2	7.651
4	6 37 17.36	2.1900	19 34 16.4	3.942	4	8 18 6.07	2.0130	14 47 59.3	7.713
5	6 39 28.65	2.1862	19 30 17.1	4.036	5	8 20 6.75	2.0097	14 40 14.7	7.774
6	6 41 39.71	2.1825	19 26 12.1	4.131	6	8 22 7.23	2.0063	14 32 26.4	7.834
7	6 43 50.55	2.1788	19 22 1.4	4.225	7	8 24 7.50	2.0029	14 24 34.6	7.893
8	6 46 1.17	2.1752	19 17 45.1	4.318	8	8 26 7.58	1.9996	14 16 39.2	7.952
9	6 48 11.57	2.1715	19 13 23.3	4.410	9	8 28 7.46	1.9963	14 8 40.3	8.011
10	6 50 21.74	2.1676	19 8 55.9	4.502	10	8 30 7.14	1.9931	14 0 37.9	8.068
11	6 52 31.68	2.1638	19 4 23.0	4.593	11	8 32 6.63	1.9899	13 52 32.1	8.124
12	6 54 41.40	2.1601	18 59 44.7	4.683	12	8 34 5.93	1.9866	13 44 23.0	8.180
13	6 56 50.89	2.1564	18 55 1.0	4.773	13	8 36 5.03	1.9834	13 36 10.5	8.236
14	6 59 0.16	2.1526	18 50 11.9	4.862	14	8 38 3.94	1.9803	13 27 54.7	8.290
15	7 1 9.20	2.1487	18 45 17.5	4.950	15	8 40 2.67	1.9772	13 19 35.7	8.343
16	7 3 18.01	2.1449	18 40 17.9	5.038	16	8 42 1.21	1.9742	13 11 13.5	8.397
17	7 5 26.59	2.1412	18 35 13.0	5.125	17	8 43 59.57	1.9711	13 2 48.1	8.450
18	7 7 34.95	2.1374	18 30 2.9	5.211	18	8 45 57.74	1.9680	12 54 19.5	8.502
19	7 9 43.08	2.1336	18 24 47.7	5.296	19	8 47 55.73	1.9650	12 45 47.9	8.553
20	7 11 50.98	2.1298	18 19 27.4	5.381	20	8 49 53.54	1.9620	12 37 13.2	8.603
21	7 13 58.66	2.1261	18 14 2.0	5.465	21	8 51 51.17	1.9591	12 28 35.5	8.652
22	7 16 6.11	2.1222	18 8 31.6	5.548	22	8 53 48.63	1.9562	12 19 54.9	8.701
23	7 18 13.33	2.1184	18 2 56.2	5.631	23	8 55 45.91	1.9533	12 11 11.4	8.750
24	7 20 20.32	2.1147	N.17 57 15.9	5.713	24	8 57 43.02	1.9504	N.12 2 24.9	8.798

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	8 57 43.02	1.9504	N.12 2 24.9	8.798
1	8 59 39.96	1.9476	11 53 35.6	8.844
2	9 1 36.73	1.9448	11 44 43.6	8.890
3	9 3 33.34	1.9421	11 35 48.8	8.936
4	9 5 29.78	1.9393	11 26 51.3	8.981
5	9 7 26.06	1.9366	11 17 51.1	9.025
6	9 9 22.17	1.9338	11 8 48.3	9.068
7	9 11 18.12	1.9312	10 59 42.9	9.111
8	9 13 13.92	1.9287	10 50 35.0	9.153
9	9 15 9.57	1.9262	10 41 24.6	9.194
10	9 17 5.07	1.9237	10 32 11.7	9.235
11	9 19 0.41	1.9211	10 22 56.4	9.275
12	9 20 55.60	1.9186	10 13 38.7	9.315
13	9 22 50.65	1.9162	10 4 18.6	9.353
14	9 24 45.55	1.9138	9 54 56.3	9.391
15	9 26 40.31	1.9115	9 45 31.7	9.428
16	9 28 34.93	1.9092	9 36 4.9	9.465
17	9 30 29.41	1.9069	9 26 35.9	9.501
18	9 32 23.76	1.9046	9 17 4.8	9.536
19	9 34 17.97	1.9024	9 7 31.6	9.571
20	9 36 12.05	1.9003	8 57 56.3	9.605
21	9 38 6.01	1.8982	8 48 19.0	9.638
22	9 39 59.84	1.8961	8 38 39.8	9.670
23	9 41 53.54	1.8940	N. 8 28 58.6	9.702

SUNDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 43 47.12	1.8920	N. 8 19 15.5	9.733
1	9 45 40.58	1.8900	8 9 30.6	9.763
2	9 47 33.92	1.8881	7 59 43.9	9.794
3	9 49 27.15	1.8862	7 49 55.3	9.824
4	9 51 20.26	1.8843	7 40 5.0	9.852
5	9 53 13.26	1.8825	7 30 13.0	9.880
6	9 55 6.16	1.8807	7 20 19.4	9.907
7	9 56 58.95	1.8790	7 10 24.2	9.933
8	9 58 51.64	1.8773	7 0 27.4	9.960
9	10 0 44.22	1.8756	6 50 29.0	9.986
10	10 2 36.71	1.8740	6 40 29.1	10.010
11	10 4 29.10	1.8723	6 30 27.8	10.034
12	10 6 21.39	1.8707	6 20 25.0	10.058
13	10 8 13.59	1.8693	6 10 20.8	10.081
14	10 10 5.71	1.8679	6 0 15.3	10.102
15	10 11 57.74	1.8664	5 50 8.6	10.123
16	10 13 49.68	1.8650	5 40 0.6	10.144
17	10 15 41.54	1.8637	5 29 51.3	10.165
18	10 17 33.32	1.8624	5 19 40.8	10.184
19	10 19 25.02	1.8611	5 9 29.2	10.203
20	10 21 16.65	1.8599	4 59 16.5	10.221
21	10 23 8.21	1.8587	4 49 2.7	10.239
22	10 24 59.70	1.8576	4 38 47.8	10.256
23	10 26 51.12	1.8564	4 28 32.0	10.272
24	10 28 42.47	1.8553	N. 4 18 15.2	10.287

MONDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m
	h m s	s	° ′ ″	″
0	10 28 42.47	1.8553	N. 4 18 15.2	10.287
1	10 30 33.76	1.8543	4 7 57.5	10.302
2	10 32 24.99	1.8534	3 57 38.9	10.317
3	10 34 16.17	1.8525	3 47 19.5	10.330
4	10 36 7.29	1.8516	3 36 59.3	10.343
5	10 37 58.36	1.8507	3 26 38.3	10.356
6	10 39 49.38	1.8499	3 16 16.5	10.368
7	10 41 40.35	1.8492	3 5 54.1	10.379
8	10 43 31.28	1.8484	2 55 31.0	10.390
9	10 45 22.16	1.8477	2 45 7.3	10.399
10	10 47 13.01	1.8471	2 34 43.1	10.408
11	10 49 3.82	1.8465	2 24 18.3	10.417
12	10 50 54.59	1.8459	2 13 53.0	10.425
13	10 52 45.33	1.8454	2 3 27.3	10.433
14	10 54 36.04	1.8449	1 53 1.1	10.440
15	10 56 26.72	1.8445	1 42 34.5	10.446
16	10 58 17.38	1.8441	1 32 7.6	10.451
17	11 0 8.02	1.8437	1 21 40.4	10.456
18	11 1 58.63	1.8434	1 11 12.9	10.460
19	11 3 49.23	1.8432	1 0 45.2	10.464
20	11 5 39.81	1.8429	0 50 17.3	10.467
21	11 7 30.38	1.8427	0 39 49.2	10.469
22	11 9 20.94	1.8427	0 29 21.0	10.471
23	11 11 11.50	1.8426	N. 0 18 52.7	10.472

TUESDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m
0	11 13 2.05	1.8425	N. 0 8 24.4	10.472
1	11 14 52.60	1.8425	S. 0 2 3.9	10.472
2	11 16 43.15	1.8425	0 12 32.2	10.471
3	11 18 33.70	1.8426	0 23 0.4	10.469
4	11 20 24.26	1.8427	0 33 28.5	10.467
5	11 22 14.82	1.8428	0 43 56.4	10.464
6	11 24 5.39	1.8430	0 54 24.2	10.461
7	11 25 55.98	1.8433	1 4 51.8	10.457
8	11 27 46.59	1.8437	1 15 19.1	10.452
9	11 29 37.22	1.8440	1 25 46.1	10.447
10	11 31 27.87	1.8443	1 36 12.8	10.441
11	11 33 18.54	1.8447	1 46 39.1	10.434
12	11 35 9.23	1.8451	1 57 4.9	10.427
13	11 36 59.95	1.8456	2 7 30.3	10.419
14	11 38 50.70	1.8462	2 17 55.2	10.411
15	11 40 41.49	1.8467	2 28 19.6	10.402
16	11 42 32.31	1.8473	2 38 43.5	10.392
17	11 44 23.17	1.8480	2 49 6.7	10.382
18	11 46 14.07	1.8487	2 59 29.3	10.371
19	11 48 5.01	1.8494	3 9 51.2	10.359
20	11 49 56.00	1.8502	3 20 12.4	10.347
21	11 51 47.04	1.8511	3 30 32.9	10.334
22	11 53 38.13	1.8519	3 40 52.5	10.320
23	11 55 29.27	1.8528	3 51 11.3	10.307
24	11 57 20.47	1.8538	S. 4 1 29.3	10.293

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 57 20.47	1.8538	S. 4 1 29.3	10.293
1	11 59 11.73	1.8548	4 11 46.4	10.277
2	12 1 3.05	1.8558	4 22 2.5	10.260
3	12 2 54.43	1.8568	4 32 17.6	10.243
4	12 4 45.87	1.8579	4 42 31.7	10.226
5	12 6 37.38	1.8591	4 52 44.7	10.208
6	12 8 28.96	1.8603	5 2 56.6	10.189
7	12 10 20.61	1.8615	5 13 7.4	10.170
8	12 12 12.34	1.8628	5 23 17.0	10.150
9	12 14 4.15	1.8642	5 33 25.4	10.130
10	12 15 56.04	1.8655	5 43 32.6	10.108
11	12 17 48.01	1.8669	5 53 38.4	10.086
12	12 19 40.07	1.8683	6 3 42.9	10.064
13	12 21 32.21	1.8697	6 13 46.1	10.041
14	12 23 24.44	1.8713	6 23 47.8	10.017
15	12 25 16.77	1.8729	6 33 48.1	9.992
16	12 27 9.19	1.8745	6 43 46.9	9.967
17	12 29 1.71	1.8762	6 53 44.2	9.942
18	12 30 54.33	1.8778	7 3 40.0	9.916
19	12 32 47.05	1.8795	7 13 34.1	9.889
20	12 34 39.87	1.8812	7 23 26.6	9.861
21	12 36 32.80	1.8830	7 33 17.4	9.832
22	12 38 25.83	1.8848	7 43 6.5	9.803
23	12 40 18.98	1.8867	S. 7 52 53.8	9.774

THURSDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 42 12.24	1.8887	S. 8 2 39.4	9.744
1	12 44 5.62	1.8906	8 12 23.1	9.713
2	12 45 59.11	1.8925	8 22 4.9	9.681
3	12 47 52.72	1.8946	8 31 44.8	9.649
4	12 49 46.46	1.8967	8 41 22.8	9.616
5	12 51 40.32	1.8987	8 50 58.7	9.582
6	12 53 34.30	1.9008	9 0 32.6	9.548
7	12 55 28.41	1.9029	9 10 4.4	9.513
8	12 57 22.65	1.9051	9 19 34.1	9.478
9	12 59 17.03	1.9074	9 29 1.7	9.442
10	13 1 11.54	1.9097	9 38 27.1	9.404
11	13 3 6.19	1.9120	9 47 50.2	9.367
12	13 5 0.98	1.9143	9 57 11.1	9.329
13	13 6 55.91	1.9167	10 6 29.7	9.290
14	13 8 50.99	1.9192	10 15 45.9	9.249
15	13 10 46.21	1.9216	10 24 59.6	9.208
16	13 12 41.58	1.9241	10 34 10.9	9.168
17	13 14 37.10	1.9265	10 43 19.8	9.127
18	13 16 32.76	1.9290	10 52 26.2	9.085
19	13 18 28.58	1.9316	11 1 30.0	9.042
20	13 20 24.56	1.9343	11 10 31.2	8.998
21	13 22 20.70	1.9369	11 19 29.7	8.953
22	13 24 16.99	1.9396	11 28 25.6	8.908
23	13 26 13.45	1.9423	11 37 18.7	8.863
24	13 28 10.07	1.9451	S. 11 46 9.1	8.817

FRIDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	13 28 10.07	1.9451	S. 11 46 9.1	8.817
1	13 30 6.86	1.9479	11 54 56.7	8.769
2	13 32 3.82	1.9506	12 3 41.4	8.721
3	13 34 0.94	1.9534	12 12 23.2	8.673
4	13 35 58.23	1.9563	12 21 2.1	8.624
5	13 37 55.70	1.9592	12 29 38.1	8.575
6	13 39 53.34	1.9622	12 38 11.1	8.524
7	13 41 51.16	1.9652	12 46 41.0	8.473
8	13 43 49.16	1.9681	12 55 7.8	8.421
9	13 45 47.33	1.9711	13 3 31.5	8.368
10	13 47 45.69	1.9742	13 11 52.0	8.315
11	13 49 44.23	1.9772	13 20 9.3	8.261
12	13 51 42.95	1.9803	13 28 23.3	8.206
13	13 53 41.86	1.9834	13 36 34.0	8.151
14	13 55 40.96	1.9866	13 44 41.4	8.095
15	13 57 40.25	1.9897	13 52 45.4	8.038
16	13 59 39.73	1.9929	14 0 46.0	7.981
17	14 1 39.40	1.9962	14 8 43.1	7.923
18	14 3 39.27	1.9994	14 16 36.7	7.864
19	14 5 39.33	2.0027	14 24 26.8	7.804
20	14 7 39.59	2.0060	14 32 13.2	7.743
21	14 9 40.05	2.0093	14 39 56.0	7.682
22	14 11 40.70	2.0126	14 47 35.1	7.621
23	14 13 41.56	2.0160	S. 14 55 10.5	7.558

SATURDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 15 42.62	2.0193	S. 15 2 42.1	7.495
1	14 17 43.88	2.0227	15 10 9.9	7.432
2	14 19 45.35	2.0262	15 17 33.9	7.367
3	14 21 47.02	2.0296	15 24 54.0	7.302
4	14 23 48.90	2.0331	15 32 10.2	7.237
5	14 25 50.99	2.0366	15 39 22.4	7.170
6	14 27 53.29	2.0400	15 46 30.6	7.102
7	14 29 55.79	2.0435	15 53 34.7	7.034
8	14 31 58.51	2.0471	16 0 34.7	6.966
9	14 34 1.44	2.0507	16 7 30.6	6.897
10	14 36 4.59	2.0542	16 14 22.3	6.827
11	14 38 7.95	2.0577	16 21 9.8	6.756
12	14 40 11.52	2.0613	16 27 53.0	6.684
13	14 42 15.31	2.0650	16 34 31.9	6.611
14	14 44 19.32	2.0686	16 41 6.4	6.538
15	14 46 23.54	2.0722	16 47 36.5	6.465
16	14 48 27.98	2.0758	16 54 2.2	6.391
17	14 50 32.64	2.0794	17 0 23.4	6.316
18	14 52 37.51	2.0830	17 6 40.1	6.240
19	14 54 42.60	2.0867	17 12 52.2	6.163
20	14 56 47.92	2.0905	17 18 59.7	6.086
21	14 58 53.46	2.0942	17 25 2.5	6.008
22	15 0 59.22	2.0978	17 31 0.7	5.930
23	15 3 5.20	2.1015	17 36 54.1	5.850
24	15 5 11.40	2.1052	S. 17 42 42.7	5.770

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 5 11.40	2.1052	S. 17 42 42.7	5.770
1	15 7 17.82	2.1089	17 48 26.5	5.689
2	15 9 24.47	2.1126	17 54 5.4	5.608
3	15 11 31.34	2.1163	17 59 39.5	5.526
4	15 13 38.43	2.1200	18 5 8.6	5.443
5	15 15 45.74	2.1237	18 10 32.7	5.360
6	15 17 53.28	2.1275	18 15 51.8	5.276
7	15 20 1.04	2.1312	18 21 5.8	5.191
8	15 22 9.02	2.1349	18 26 14.7	5.105
9	15 24 17.23	2.1386	18 31 18.4	5.018
10	15 26 25.66	2.1423	18 36 16.9	4.932
11	15 28 34.31	2.1461	18 41 10.2	4.845
12	15 30 43.19	2.1498	18 45 58.3	4.757
13	15 32 52.29	2.1535	18 50 41.0	4.667
14	15 35 1.61	2.1572	18 55 18.3	4.577
15	15 37 11.15	2.1608	18 59 50.2	4.487
16	15 39 20.91	2.1645	19 4 16.7	4.397
17	15 41 30.89	2.1682	19 8 37.8	4.306
18	15 43 41.09	2.1718	19 12 53.4	4.213
19	15 45 51.51	2.1755	19 17 3.4	4.120
20	15 48 2.15	2.1792	19 21 7.8	4.026
21	15 50 13.01	2.1828	19 25 6.5	3.932
22	15 52 24.09	2.1865	19 28 59.6	3.837
23	15 54 35.39	2.1901	S. 19 32 46.9	3.741

MONDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	15 56 46.90	2.1937	S. 19 36 28.5	3.645
1	15 58 58.63	2.1972	19 40 4.3	3.548
2	16 1 10.57	2.2007	19 43 34.3	3.451
3	16 3 22.72	2.2042	19 46 58.4	3.352
4	16 5 35.08	2.2078	19 50 16.6	3.253
5	16 7 47.66	2.2114	19 53 28.8	3.154
6	16 10 0.45	2.2149	19 56 35.1	3.055
7	16 12 13.45	2.2184	19 59 35.4	2.954
8	16 14 26.66	2.2218	20 2 29.6	2.853
9	16 16 40.07	2.2253	20 5 17.7	2.751
10	16 18 53.69	2.2287	20 7 59.7	2.648
11	16 21 7.51	2.2320	20 10 35.5	2.546
12	16 23 21.53	2.2353	20 13 5.2	2.443
13	16 25 35.75	2.2387	20 15 28.7	2.338
14	16 27 50.17	2.2420	20 17 45.8	2.233
15	16 30 4.79	2.2453	20 19 56.6	2.128
16	16 32 19.61	2.2487	20 22 1.1	2.023
17	16 34 34.63	2.2519	20 23 59.3	1.917
18	16 36 49.84	2.2551	20 25 51.1	1.809
19	16 39 5.24	2.2582	20 27 36.4	1.702
20	16 41 20.83	2.2614	20 29 15.3	1.594
21	16 43 36.61	2.2645	20 30 47.7	1.486
22	16 45 52.57	2.2676	20 32 13.6	1.377
23	16 48 8.72	2.2707	20 33 32.9	1.267
24	16 50 25.05	2.2737	S. 20 34 45.6	1.157

TUESDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	16 50 25.05	2.2737	S. 20 34 45.6	1.157
1	16 52 41.56	2.2767	20 35 51.7	1.047
2	16 54 58.25	2.2797	20 36 51.2	0.936
3	16 57 15.12	2.2826	20 37 44.0	0.824
4	16 59 32.16	2.2854	20 38 30.1	0.712
5	17 1 49.37	2.2883	20 39 9.5	0.600
6	17 4 6.75	2.2911	20 39 42.1	0.488
7	17 6 24.30	2.2938	20 40 8.0	0.375
8	17 8 42.01	2.2966	20 40 27.1	0.261
9	17 10 59.89	2.2993	20 40 39.3	0.147
10	17 13 17.93	2.3019	20 40 44.7	− 0.032
11	17 15 36.12	2.3045	20 40 43.2	+ 0.082
12	17 17 54.47	2.3071	20 40 34.8	0.197
13	17 20 12.97	2.3097	20 40 19.5	0.313
14	17 22 31.63	2.3122	20 39 57.2	0.429
15	17 24 50.44	2.3147	20 39 28.0	0.545
16	17 27 9.39	2.3171	20 38 51.7	0.662
17	17 29 28.49	2.3195	20 38 8.6	0.779
18	17 31 47.73	2.3218	20 37 18.4	0.896
19	17 34 7.11	2.3241	20 36 21.1	1.013
20	17 36 26.62	2.3263	20 35 16.8	1.131
21	17 38 46.27	2.3286	20 34 5.4	1.249
22	17 41 6.05	2.3308	20 32 46.9	1.368
23	17 43 25.96	2.3329	S. 20 31 21.3	1.487

WEDNESDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	17 45 46.00	2.3350	S. 20 29 48.5	1.606
1	17 48 6.16	2.3370	20 28 8.6	1.724
2	17 50 26.44	2.3390	20 26 21.6	1.843
3	17 52 46.84	2.3409	20 24 27.4	1.963
4	17 55 7.35	2.3428	20 22 26.0	2.083
5	17 57 27.97	2.3447	20 20 17.4	2.203
6	17 59 48.71	2.3465	20 18 1.6	2.323
7	18 2 9.55	2.3482	20 15 38.6	2.443
8	18 4 30.50	2.3500	20 13 8.4	2.564
9	18 6 51.55	2.3517	20 10 30.9	2.685
10	18 9 12.70	2.3533	20 7 46.2	2.805
11	18 11 33.94	2.3548	20 4 54.3	2.926
12	18 13 55.28	2.3564	20 1 55.1	3.047
13	18 16 16.71	2.3579	19 58 48.7	3.167
14	18 18 38.23	2.3593	19 55 35.0	3.288
15	18 20 59.83	2.3607	19 52 14.1	3.409
16	18 23 21.52	2.3621	19 48 45.9	3.531
17	18 25 43.29	2.3634	19 45 10.4	3.652
18	18 28 5.13	2.3647	19 41 27.7	3.772
19	18 30 27.05	2.3659	19 37 37.7	3.893
20	18 32 49.04	2.3671	19 33 40.5	4.014
21	18 35 11.10	2.3682	19 29 36.0	4.135
22	18 37 33.23	2.3693	19 25 24.3	4.256
23	18 39 55.42	2.3704	19 21 5.3	4.377
24	18 42 17.68	2.3715	S. 19 16 39.1	4.497

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 21.					SATURDAY 23.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 42 17.68	2.3715	S. 19 16 39.1	4.497	0	20 36 35.94	2.3806	S. 13 27 33.3	9.851
1	18 44 40.00	2.3724	19 12 5.7	4.617	1	20 38 58.76	2.3802	13 17 39.3	9.946
2	18 47 2.37	2.3733	19 7 25.0	4.738	2	20 41 21.56	2.3799	13 7 39.7	10.040
3	18 49 24.80	2.3742	19 2 37.1	4.858	3	20 43 44.35	2.3796	12 57 34.5	10.133
4	18 51 47.28	2.3751	18 57 42.0	4.978	4	20 46 7.12	2.3792	12 47 23.7	10.226
5	18 54 9.81	2.3758	18 52 39.7	5.099	5	20 48 29.86	2.3788	12 37 7.3	10.318
6	18 56 32.38	2.3766	18 47 30.1	5.219	6	20 50 52.58	2.3785	12 26 45.5	10.408
7	18 58 55.00	2.3773	18 42 13.4	5.338	7	20 53 15.28	2.3782	12 16 18.3	10.498
8	19 1 17.66	2.3780	18 36 49.5	5.457	8	20 55 37.96	2.3778	12 5 45.7	10.586
9	19 3 40.36	2.3786	18 31 18.5	5.576	9	20 58 0.62	2.3774	11 55 7.9	10.673
10	19 6 3.10	2.3792	18 25 40.4	5.695	10	21 0 23.25	2.3770	11 44 24.9	10.760
11	19 8 25.87	2.3798	18 19 55.1	5.814	11	21 2 45.86	2.3767	11 33 36.7	10.846
12	19 10 48.68	2.3804	18 14 2.7	5.932	12	21 5 8.45	2.3763	11 22 43.4	10.930
13	19 13 11.52	2.3808	18 8 3.2	6.050	13	21 7 31.02	2.3760	11 11 45.1	11.012
14	19 15 34.38	2.3813	18 1 56.7	6.167	14	21 9 53.57	2.3757	11 0 41.9	11.094
15	19 17 57.27	2.3818	17 55 43.1	6.285	15	21 12 16.10	2.3753	10 49 33.8	11.175
16	19 20 20.19	2.3822	17 49 22.5	6.402	16	21 14 38.61	2.3750	10 38 20.9	11.255
17	19 22 43.13	2.3825	17 42 54.9	6.518	17	21 17 1.10	2.3746	10 27 3.2	11.333
18	19 25 6.09	2.3828	17 36 20.3	6.634	18	21 19 23.56	2.3742	10 15 40.9	11.410
19	19 27 29.07	2.3831	17 29 38.8	6.750	19	21 21 46.00	2.3739	10 4 14.0	11.486
20	19 29 52.06	2.3833	17 22 50.3	6.866	20	21 24 8.43	2.3736	9 52 42.6	11.561
21	19 32 15.07	2.3836	17 15 54.9	6.981	21	21 26 30.84	2.3733	9 41 6.7	11.635
22	19 34 38.09	2.3838	17 8 52.6	7.095	22	21 28 53.23	2.3731	9 29 26.4	11.707
23	19 37 1.12	2.3839	S. 17 1 43.5	7.208	23	21 31 15.61	2.3728	S. 9 17 41.8	11.777
FRIDAY 22.					SUNDAY 24.				
0	19 39 24.16	2.3841	S. 16 54 27.6	7.322	0	21 33 37.97	2.3725	S. 9 5 53.1	11.847
1	19 41 47.21	2.3842	16 47 4.9	7.435	1	21 36 0.31	2.3722	8 54 0.2	11.916
2	19 44 10.26	2.3842	16 39 35.4	7.547	2	21 38 22.64	2.3720	8 42 3.2	11.982
3	19 46 33.31	2.3843	16 31 59.2	7.659	3	21 40 44.95	2.3718	8 30 2.3	12.047
4	19 48 56.37	2.3843	16 24 16.3	7.770	4	21 43 7.25	2.3716	8 17 57.5	12.112
5	19 51 19.43	2.3843	16 16 26.8	7.881	5	21 45 29.54	2.3713	8 5 48.9	12.175
6	19 53 42.48	2.3842	16 8 30.6	7.992	6	21 47 51.81	2.3711	7 53 36.5	12.237
7	19 56 5.53	2.3842	16 0 27.8	8.101	7	21 50 14.07	2.3709	7 41 20.5	12.297
8	19 58 28.58	2.3842	15 52 18.5	8.209	8	21 52 36.32	2.3708	7 29 0.9	12.356
9	20 0 51.63	2.3841	15 44 2.7	8.318	9	21 54 58.56	2.3707	7 16 37.8	12.413
10	20 3 14.67	2.3839	15 35 40.4	8.426	10	21 57 20.80	2.3706	7 4 11.3	12.469
11	20 5 37.70	2.3837	15 27 11.6	8.532	11	21 59 43.03	2.3704	6 51 41.5	12.523
12	20 8 0.72	2.3836	15 18 36.5	8.637	12	22 2 5.25	2.3703	6 39 8.5	12.577
13	20 10 23.73	2.3834	15 9 55.1	8.743	13	22 4 27.47	2.3702	6 26 32.3	12.628
14	20 12 46.73	2.3833	15 1 7.3	8.848	14	22 6 49.68	2.3702	6 13 53.1	12.678
15	20 15 9.72	2.3831	14 52 13.3	8.952	15	22 9 11.89	2.3702	6 1 10.9	12.727
16	20 17 32.70	2.3828	14 43 13.1	9.055	16	22 11 34.10	2.3702	5 48 25.8	12.774
17	20 19 55.66	2.3826	14 34 6.7	9.158	17	22 13 56.31	2.3702	5 35 38.0	12.819
18	20 22 18.61	2.3823	14 24 54.1	9.260	18	22 16 18.53	2.3703	5 22 47.5	12.863
19	20 24 41.54	2.3820	14 15 35.5	9.360	19	22 18 40.75	2.3703	5 9 54.4	12.906
20	20 27 4.45	2.3817	14 6 10.9	9.460	20	22 21 2.97	2.3703	4 56 58.8	12.947
21	20 29 27.35	2.3815	13 56 40.3	9.559	21	22 23 25.19	2.3704	4 44 0.7	12.987
22	20 31 50.23	2.3812	13 47 3.8	9.657	22	22 25 47.42	2.3706	4 31 0.3	13.025
23	20 34 13.09	2.3809	13 37 21.5	9.754	23	22 28 9.66	2.3707	4 17 57.7	13.061
24	20 36 35.94	2.3806	S. 13 27 33.3	9.851	24	22 30 31.91	2.3709	S. 4 4 53.0	13.096

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 25.					WEDNESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 30 31.91	2.3709	S. 4 4 53.0	13.096	0	0 25 0.36	2.4077	N. 6 32 0.0	12.783
1	22 32 54.17	2.3711	3 51 46.2	13.129	1	0 27 24.86	2.4090	6 44 45.6	12.736
2	22 35 16.44	2.3713	3 38 37.5	13.160	2	0 29 49.44	2.4103	6 57 28.3	12.686
3	22 37 38.73	2.3716	3 25 27.0	13.190	3	0 32 14.10	2.4116	7 10 7.9	12.634
4	22 40 1.03	2.3718	3 12 14.7	13.218	4	0 34 38.83	2.4129	7 22 44.4	12.580
5	22 42 23.35	2.3722	2 59 0.8	13.245	5	0 37 3.64	2.4142	7 35 17.7	12.527
6	22 44 45.69	2.3725	2 45 45.3	13.270	6	0 39 28.53	2.4155	7 47 47.6	12.470
7	22 47 8.05	2.3728	2 32 28.4	13.293	7	0 41 53.50	2.4168	8 0 14.1	12.412
8	22 49 30.43	2.3732	2 19 10.1	13.316	8	0 44 18.55	2.4181	8 12 37.0	12.352
9	22 51 52.83	2.3736	2 5 50.5	13.336	9	0 46 43.68	2.4194	8 24 56.3	12.291
10	22 54 15.26	2.3740	1 52 29.8	13.354	10	0 49 8.88	2.4207	8 37 11.9	12.228
11	22 56 37.71	2.3744	1 39 8.0	13.371	11	0 51 34.16	2.4220	8 49 23.7	12.163
12	22 59 0.19	2.3749	1 25 45.3	13.386	12	0 53 59.52	2.4233	9 1 31.5	12.097
13	23 1 22.70	2.3754	1 12 21.7	13.399	13	0 56 24.96	2.4247	9 13 35.3	12.029
14	23 3 45.24	2.3759	0 58 57.4	13.411	14	0 58 50.48	2.4260	9 25 35.0	11.961
15	23 6 7.81	2.3765	0 45 32.4	13.421	15	1 1 16.08	2.4274	9 37 30.6	11.891
16	23 8 30.42	2.3771	0 32 6.9	13.428	16	1 3 41.77	2.4288	9 49 21.9	11.818
17	23 10 53.06	2.3777	0 18 41.0	13.435	17	1 6 7.54	2.4302	10 1 8.8	11.744
18	23 13 15.74	2.3783	S. 0 5 14.7	13.440	18	1 8 33.39	2.4315	10 12 51.2	11.669
19	23 15 38.46	2.3790	N. 0 8 11.8	13.443	19	1 10 59.32	2 4327	10 24 29.1	11.593
20	23 18 1.22	2.3797	0 21 38.5	13.445	20	1 13 25.32	2.4340	10 36 2.4	11.515
21	23 20 24.02	2.3803	0 35 5.2	13.444	21	1 15 51.40	2.4353	10 47 30.9	11.435
22	23 22 46.86	2.3810	0 48 31.8	13.442	22	1 18 17.56	2.4366	10 58 54.6	11.354
23	23 25 9.74	2.3818	N. 1 1 58.3	13.439	23	1 20 43.80	2.4379	N.11 10 13.4	11.272
	TUESDAY 26.					THURSDAY 28.			
0	23 27 32.67	2.3826	N. 1 15 24.5	13.433	0	1 23 10.11	2.4392	N.11 21 27.3	11.189
1	23 29 55.65	2.3834	1 28 50.3	13.426	1	1 25 36.50	2.4405	11 32 36.1	11.104
2	23 32 18.68	2.3842	1 42 15.6	13.417	2	1 28 2.97	2.4417	11 43 39.8	11.017
3	23 34 41.76	2.3851	1 55 40.3	13.406	3	1 30 29.51	2 4429	11 54 38.2	10.929
4	23 37 4.89	2.3859	2 9 4.3	13.393	4	1 32 56.12	2.4442	12 5 31.3	10.840
5	23 39 28.07	2.3868	2 22 27.5	13.380	5	1 35 22.81	2.4454	12 16 19.0	10.750
6	23 41 51.31	2.3878	2 35 49.9	13.365	6	1 37 49.57	2.4466	12 27 1.3	10.658
7	23 44 14.61	2.3887	2 49 11.3	13.347	7	1 40 16.40	2.4477	12 37 38.0	10.565
8	23 46 37.96	2.3897	3 2 31.5	13.327	8	1 42 43.30	2.4488	12 48 9.1	10.472
9	23 49 1.37	2.3907	3 15 50.5	13.306	9	1 45 10.26	2.4499	12 58 34.6	10.377
10	23 51 24.84	2.3917	3 29 8.2	13.283	10	1 47 37.29	2.4511	13 8 54.3	10.280
11	23 53 48.37	2.3927	3 42 24.5	13.258	11	1 50 4.39	2.4522	13 19 8.2	10.182
12	23 56 11.96	2.3937	3 55 39.2	13.232	12	1 52 31.56	2.4533	13 29 16.2	10.083
13	23 58 35.62	2.3948	4 8 52.3	13.204	13	1 54 58.79	2.4543	13 39 18.2	9.983
14	0 0 59.34	2.3959	4 22 3.7	13.175	14	1 57 26.08	2.4552	13 49 14.2	9.882
15	0 3 23.13	2.3971	4 35 13.3	13.143	15	1 59 53.42	2.4562	13 59 4.0	9.779
16	0 5 46.99	2.3982	4 48 20.9	13.110	16	2 2 20.82	2.4572	14 8 47.6	9.675
17	0 8 10.91	2.3993	5 1 26.5	13.076	17	2 4 48.28	2.4581	14 18 25.0	9.571
18	0 10 34.90	2.4004	5 14 30.0	13.039	18	2 7 15.79	2.4590	14 27 56.1	9.465
19	0 12 58.96	2.4016	5 27 31.2	13.001	19	2 9 43.36	2.4598	14 37 20.8	9.358
20	0 15 23.09	2.4028	5 40 30.1	12.961	20	2 12 10.97	2.4606	14 46 39.1	9.251
21	0 17 47.30	2.4041	5 53 26.5	12.919	21	2 14 38.63	2.4614	14 55 50.9	9.142
22	0 20 11.58	2.4053	6 6 20.4	12.876	22	2 17 6.34	2.4621	15 4 56.1	9.032
23	0 22 35.93	2.4065	6 19 11.6	12.830	23	2 19 34.09	2.4628	15 13 54.8	8.922
24	0 25 0.36	2.4077	N. 6 32 0.0	12.783	24	2 22 1.88	2.4635	N.15 22 46.8	8.811

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 29.					SATURDAY 30.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 22 1.88	2.4635	N.15 22 46.8	8.811	0	3 21 14.14	2.4653	N.18 20 11.7	5.914
1	2 24 29.71	2.4642	15 31 32.1	8.698	1	3 23 42.04	2.4646	18 26 2.7	5.786
2	2 26 57.58	2.4648	15 40 10.6	8.584	2	3 26 9.90	2.4639	18 31 46.0	5.658
3	2 29 25.48	2.4653	15 48 42.2	8.469	3	3 28 37.71	2.4632	18 37 21.7	5.531
4	2 31 53.41	2.4658	15 57 6.9	8.355	4	3 31 5.48	2.4624	18 42 49.7	5.403
5	2 34 21.37	2.4663	16 5 24.8	8.240	5	3 33 33.20	2.4616	18 48 10.0	5.274
6	2 36 49.36	2.4667	16 13 35.7	8.123	6	3 36 0.87	2.4607	18 53 22.6	5.145
7	2 39 17.37	2.4670	16 21 39.5	8.005	7	3 38 28.48	2.4597	18 58 27.4	5.016
8	2 41 45.40	2.4673	16 29 36.3	7.887	8	3 40 56.03	2.4586	19 3 24.5	4.887
9	2 44 13.45	2.4676	16 37 26.0	7.768	9	3 43 23.51	2.4574	19 8 13.9	4.758
10	2 46 41.51	2.4678	16 45 8.5	7.648	10	3 45 50.92	2.4563	19 12 55.5	4.628
11	2 49 9.58	2.4679	16 52 43.8	7.528	11	3 48 18.26	2.4551	19 17 29.3	4.498
12	2 51 37.66	2.4680	17 0 11.9	7.407	12	3 50 45.53	2.4538	19 21 55.3	4.368
13	2 54 5.74	2.4681	17 7 32.7	7.286	13	3 53 12.72	2.4524	19 26 13.5	4.238
14	2 56 33.83	2.4682	17 14 46.2	7.164	14	3 55 39.82	2.4509	19 30 23.9	4.108
15	2 59 1.92	2.4681	17 21 52.3	7.041	15	3 58 6.83	2.4494	19 34 26.5	3.979
16	3 1 30.00	2.4680	17 28 51.1	6.917	16	4 0 33.75	2.4479	19 38 21.4	3.850
17	3 3 58.08	2.4679	17 35 42.4	6.793	17	4 3 0.58	2.4463	19 42 8.5	3.720
18	3 6 26.15	2.4677	17 42 26.3	6.669	18	4 5 27.31	2.4446	19 45 47.8	3 589
19	3 8 54.20	2.4674	17 49 2.7	6.544	19	4 7 53.93	2.4428	19 49 19.2	3.459
20	3 11 22.24	2.4671	17 55 31.6	6.419	20	4 10 20.45	2.4411	19 52 42.9	3.330
21	3 13 50.26	2.4668	18 1 53.0	6.293	21	4 12 46.86	2.4392	19 55 58.8	3.200
22	3 16 18.25	2.4663	18 8 6.8	6.167	22	4 15 13.15	2.4372	19 59 6.9	3.070
23	3 18 46.21	2.4658	18 14 13.0	6.041	23	4 17 39.32	2.4352	20 2 7.2	2.941
24	3 21 14.14	2.4653	N.18 20 11.7	5.914	24	4 20 5.38	2.4332	N.20 4 59.8	2.812

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter	4	1	26.7
● New Moon	12	0	58.7
☽ First Quarter	20	1	27.9
○ Full Moon	26	17	10.2

	d	h
☾ Apogee	12	1.4
☾ Perigee	26	6.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Aquilæ	W.	88° 38′ 43″	2614	90° 17′ 19″	2630	91° 55′ 33″	2647	93° 33′ 24″	2666
	Fomalhaut	W.	60 47 44	2825	62 21 40	2820	63 55 42	2818	65 29 47	2818
	α Pegasi	W.	40 53 12	2553	42 33 12	2545	44 13 23	2540	45 53 40	2538
	Aldebaran	E.	39 6 47	2229	37 19 4	2248	35 31 47	2267	33 44 59	2287
	Jupiter	E.	58 10 3	2245	56 22 43	2262	54 35 47	2279	52 49 16	2296
	Pollux	E.	81 41 33	2281	79 55 5	2298	78 9 2	2315	76 23 24	2333
	Sun	E.	129 9 13	2527	127 28 37	2543	125 48 23	2559	124 8 31	2576
2	Fomalhaut	W.	73 19 23	2843	74 52 55	2852	76 26 15	2862	77 59 22	2873
	α Pegasi	W.	54 14 45	2559	55 54 37	2567	57 34 17	2576	59 13 45	2586
	Jupiter	E.	44 2 57	2383	42 18 58	2401	40 35 25	2419	38 52 18	2437
	Pollux	E.	67 41 53	2427	65 58 57	2448	64 16 30	2468	62 34 32	2489
	Sun	E.	115 55 8	2664	114 17 40	2682	112 40 36	2700	111 3 56	2719
3	Fomalhaut	W.	85 41 0	2942	87 12 25	2958	88 43 30	2975	90 14 14	2992
	α Pegasi	W.	67 27 18	2646	69 5 10	2660	70 42 44	2673	72 20 0	2687
	α Arietis	W.	23 56 23	2755	25 31 50	2739	27 7 38	2729	28 43 39	2724
	Pollux	E.	54 12 4	2598	52 33 6	2621	50 54 40	2644	49 16 45	2669
	Sun	E.	103 6 46	2811	101 32 33	2830	99 58 44	2848	98 25 18	2866
4	α Pegasi	W.	80 21 33	2760	81 56 54	2774	83 31 56	2789	85 6 38	2804
	α Arietis	W.	36 44 16	2736	38 20 8	2743	39 55 51	2750	41 31 25	2758
	Pollux	E.	41 15 37	2801	39 41 11	2831	38 7 24	2863	36 34 18	2896
	Sun	E.	90 43 57	2955	89 12 48	2973	87 42 1	2989	86 11 35	3006
5	α Pegasi	W.	92 55 22	2877	94 28 10	2892	96 0 39	2906	97 32 50	2920
	α Arietis	W.	49 26 13	2808	51 0 31	2818	52 34 36	2828	54 8 27	2838
	Saturn	W.	27 51 31	2741	29 27 16	2753	31 2 45	2766	32 37 57	2779
	Sun	E.	78 44 31	3087	77 16 5	3101	75 47 57	3116	74 20 7	3131
6	α Arietis	W.	61 54 23	2890	63 26 55	2900	64 59 14	2909	66 31 21	2919
	Saturn	W.	40 29 59	2838	42 3 38	2848	43 37 3	2859	45 10 14	2869
	Aldebaran	W.	28 32 23	2879	30 5 9	2886	31 37 46	2894	33 10 13	2901
	Sun	E.	67 5 16	3199	65 39 6	3212	64 13 11	3225	62 47 31	3237
7	α Arietis	W.	74 9 0	2964	75 39 58	2972	77 10 46	2980	78 41 24	2988
	Saturn	W.	52 52 56	2918	54 24 52	2927	55 56 37	2935	57 28 12	2943
	Aldebaran	W.	40 50 4	2939	42 21 33	2947	43 52 52	2954	45 24 2	2962
	Jupiter	W.	20 47 42	2986	22 18 12	2992	23 48 35	2997	25 18 51	3004
	Sun	E.	55 42 41	3294	54 18 22	3304	52 54 15	3314	51 30 20	3325
8	Saturn	W.	65 3 38	2979	66 34 17	2986	68 4 47	2993	69 35 9	2998
	Aldebaran	W.	52 57 43	2994	54 28 3	3000	55 58 16	3005	57 28 22	3012
	Jupiter	W.	32 48 18	3033	34 17 50	3039	35 47 14	3044	37 16 32	3050
	Sun	E.	44 33 33	3371	43 10 43	3379	41 48 3	3387	40 25 32	3396
9	Aldebaran	W.	64 57 10	3036	66 26 38	3040	67 56 1	3044	69 25 19	3048
	Jupiter	W.	44 41 26	3073	46 10 8	3078	47 38 45	3082	49 7 17	3086
	Pollux	W.	24 41 23	3499	26 1 48	3455	27 23 2	3419	28 44 57	3388
	Sun	E.	33 35 22	3438	32 13 49	3446	30 52 25	3455	29 31 11	3464
10	Aldebaran	W.	76 50 43	3065	78 19 36	3067	79 48 26	3069	81 17 13	3072
	Jupiter	W.	56 28 53	3101	57 57 1	3104	59 25 6	3106	60 53 8	3108

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1	α Aquilæ	W.	95° 10′ 50″	2684	96° 47′ 51″	2704	98° 24′ 25″	2725	100° 0′ 31″	2747
	Fomalhaut	W.	67 3 51	2820	68 37 53	2824	70 11 50	2828	71 45 41	2835
	α Pegasi	W.	47 34 0	2539	49 14 19	2542	50 54 34	2546	52 34 43	2551
	Aldebaran	E.	31 58 41	2308	30 12 53	2330	28 27 37	2353	26 42 54	2377
	Jupiter	E.	51 3 10	2313	49 17 29	2330	47 32 13	2347	45 47 22	2365
	Pollux	E.	74 38 12	2351	72 53 27	2370	71 9 9	2388	69 25 17	2408
	Sun	E.	122 29 3	2593	120 49 58	2610	119 11 17	2628	117 33 0	2646
2	Fomalhaut	W.	79 32 15	2886	81 4 52	2898	82 37 13	2912	84 9 16	2927
	α Pegasi	W.	60 52 59	2597	62 31 58	2609	64 10 41	2621	65 49 8	2633
	Jupiter	E.	37 9 36	2456	35 27 21	2475	33 45 32	2493	32 4 9	2512
	Pollux	E.	60 53 3	2510	59 12 3	2531	57 31 33	2553	55 51 33	2575
	Sun	E.	109 27 41	2738	107 51 51	2756	106 16 25	2774	104 41 23	2793
3	Fomalhaut	W.	91 44 37	3010	93 14 37	3028	94 44 15	3047	96 13 30	3066
	α Pegasi	W.	73 56 57	2701	75 33 35	2716	77 9 54	2731	78 45 53	2745
	α Arietis	W.	30 19 47	2722	31 55 58	2722	33 32 8	2725	35 8 15	2729
	Pollux	E.	47 39 23	2694	46 2 35	2719	44 26 21	2745	42 50 41	2772
	Sun	E.	96 52 16	2884	95 19 37	2902	93 47 21	2920	92 15 28	2938
4	α Pegasi	W.	86 41 1	2818	88 15 5	2833	89 48 50	2848	91 22 16	2863
	α Arietis	W.	43 6 48	2767	44 41 59	2777	46 16 57	2787	47 51 42	2798
	Pollux	E.	35 1 54	2931	33 30 15	2970	31 59 25	3013	30 29 28	3059
	Sun	E.	84 41 30	3022	83 11 45	3039	81 42 21	3055	80 13 16	3071
5	α Pegasi	W.	99 4 43	2935	100 36 17	2950	102 7 33	2964	103 38 31	2977
	α Arietis	W.	55 42 5	2849	57 15 29	2859	58 48 40	2869	60 21 38	2880
	Saturn	W.	34 12 53	2791	35 47 33	2803	37 21 57	2815	38 56 6	2827
	Sun	E.	72 52 35	3145	71 25 20	3159	69 58 22	3173	68 31 41	3187
6	α Arietis	W.	68 3 16	2928	69 34 59	2937	71 6 31	2946	72 37 51	2955
	Saturn	W.	46 43 12	2880	48 15 57	2890	49 48 29	2899	51 20 49	2909
	Aldebaran	W.	34 42 31	2909	36 14 39	2916	37 46 37	2924	39 18 25	2931
	Sun	E.	61 22 6	3249	59 56 55	3260	58 31 57	3272	57 7 13	3282
7	α Arietis	W.	80 11 52	2996	81 42 10	3003	83 12 19	3010	84 42 19	3017
	Saturn	W.	58 59 36	2951	60 30 50	2958	62 1 55	2965	63 32 51	2973
	Aldebaran	W.	46 55 3	2969	48 25 55	2975	49 56 39	2981	51 27 15	2988
	Jupiter	W.	26 48 59	3009	28 19 0	3016	29 48 53	3022	31 18 39	3027
	Sun	E.	50 6 37	3334	48 43 5	3344	47 19 44	3352	45 56 33	3362
8	Saturn	W.	71 5 24	3004	72 35 32	3009	74 5 33	3014	75 35 28	3019
	Aldebaran	W.	58 58 20	3018	60 28 11	3022	61 57 56	3026	63 27 36	3031
	Jupiter	W.	38 45 43	3055	40 14 48	3060	41 43 46	3065	43 12 39	3069
	Sun	E.	39 3 11	3405	37 41 0	3413	36 18 58	3421	34 57 5	3430
9	Aldebaran	W.	70 54 32	3052	72 23 41	3056	73 52 45	3059	75 21 46	3061
	Jupiter	W.	50 35 44	3089	52 4 7	3092	53 32 26	3096	55 0 41	3098
	Pollux	W.	30 7 27	3362	31 30 27	3339	32 53 53	3319	34 17 42	3302
	Sun	E.	28 10 7	3474	26 49 14	3485	25 28 33	3496	24 8 4	3507
10	Aldebaran	W.	82 45 57	3074	84 14 38	3076	85 43 17	3078	87 11 54	3079
	Jupiter	W.	62 21 8	3110	63 49 5	3112	65 17 0	3114	66 44 53	3115

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10	Pollux	W.	35° 41′ 51″	3288	37° 6′ 17″	3276	38° 30′ 57″	3265	39° 55′ 50″	3254
	Sun	E.	22 47 48	3521	21 27 47	3537	20 8 4	3555	18 48 40	3576
14	Sun	W.	21 32 12	3522	22 52 12	3508	24 12 27	3497	25 32 55	3485
	Antares	E.	55 9 20	3088	53 40 56	3087	52 12 31	3086	50 44 4	3083
	α Aquilæ	E.	106 37 35	3504	105 17 15	3495	103 56 45	3486	102 36 5	3477
15	Sun	W.	32 18 5	3439	33 39 37	3431	35 1 19	3423	36 23 10	3415
	Antares	E.	43 21 14	3075	41 52 34	3073	40 23 52	3072	38 55 8	3070
	α Aquilæ	E.	95 50 29	3439	94 28 57	3433	93 7 18	3427	91 45 32	3422
16	Sun	W.	43 14 45	3372	44 37 33	3364	46 0 31	3355	47 23 39	3345
	Mars	W.	17 58 15	3288	19 22 40	3273	20 47 23	3259	22 12 23	3244
	Antares	E.	31 31 10	3069	30 2 23	3071	28 33 38	3074	27 4 57	3079
	α Aquilæ	E.	84 55 8	3394	83 32 45	3391	82 10 18	3386	80 47 46	3383
17	Sun	W.	54 22 5	3295	55 46 22	3285	57 10 51	3275	58 35 32	3264
	Mars	W.	29 21 15	3183	30 47 44	3171	32 14 28	3159	33 41 26	3147
	Spica	W.	26 41 13	2916	28 13 11	2907	29 45 21	2898	31 17 43	2887
	α Aquilæ	E.	73 54 9	3368	72 31 16	3367	71 8 22	3366	69 45 27	3366
18	Sun	W.	65 42 26	3202	67 8 33	3189	68 34 55	3175	70 1 34	3162
	Mars	W.	40 59 59	3084	42 28 28	3070	43 57 14	3057	45 26 16	3043
	Spica	W.	39 2 53	2833	40 36 38	2821	42 10 38	2809	43 44 54	2797
	Venus	W.	19 41 53	3212	21 7 48	3198	22 34 0	3183	24 0 30	3168
	α Aquilæ	E.	62 50 59	3374	61 28 13	3379	60 5 32	3385	58 42 58	3392
	Fomalhaut	E.	91 17 7	3302	89 52 58	3290	88 28 35	3279	87 3 59	3268
19	Sun	W.	77 19 3	3088	78 47 27	3073	80 16 10	3056	81 45 13	3040
	Mars	W.	52 55 48	2970	54 26 38	2955	55 57 47	2940	57 29 15	2924
	Spica	W.	51 40 25	2730	53 16 25	2716	54 52 44	2701	56 29 22	2687
	Venus	W.	31 17 26	3092	32 45 45	3076	34 14 24	3060	35 43 23	3043
	α Aquilæ	E.	51 52 49	3455	50 31 35	3475	49 10 43	3498	47 50 17	3526
	Fomalhaut	E.	79 57 53	3219	78 32 6	3209	77 6 8	3202	75 40 1	3194
20	Sun	W.	89 15 33	2956	90 46 41	2939	92 18 11	2920	93 50 4	2903
	Mars	W.	65 11 47	2841	66 45 22	2823	68 19 20	2806	69 53 40	2788
	Spica	W.	64 37 38	2609	66 16 21	2593	67 55 26	2577	69 34 53	2560
	Venus	W.	43 13 29	2957	44 44 36	2939	46 16 5	2921	47 47 57	2903
	Antares	W.	19 58 14	2804	21 32 37	2760	23 7 57	2723	24 44 6	2689
	Fomalhaut	E.	68 27 27	3168	67 0 40	3166	65 33 50	3164	64 6 58	3164
	α Pegasi	E.	84 30 22	2760	82 55 2	2744	81 19 21	2729	79 43 20	2715
21	Sun	W.	101 35 15	2811	103 9 29	2792	104 44 8	2773	106 19 11	2754
	Spica	W.	77 58 3	2474	79 39 53	2457	81 22 7	2439	83 4 46	2422
	Venus	W.	55 33 11	2809	57 7 27	2790	58 42 8	2771	60 17 14	2752
	Antares	W.	32 55 16	2551	34 35 19	2527	36 15 54	2504	37 57 2	2482
	Fomalhaut	E.	56 53 22	3193	55 27 4	3205	54 1 1	3221	52 35 17	3240
	α Pegasi	E.	71 38 22	2642	70 0 24	2629	68 22 8	2615	66 43 33	2601
22	Sun	W.	114 20 39	2660	115 58 12	2643	117 36 9	2624	119 14 31	2606
	Spica	W.	91 44 19	2334	93 29 24	2316	95 15 5	2299	97 1 6	2281
	Venus	W.	68 19 3	2656	69 56 42	2638	71 34 46	2618	73 13 16	2600

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10	Pollux	W.	41° 20′ 55″	3246	42° 46′ 10″	3237	44° 11′ 35″	3230	45° 37′ 8″	3225
	Sun	E.	17 29 39	3601	16 11 6	3634	14 53 8	3674	13 35 53	3726
14	Sun	W.	26 53 36	3475	28 14 28	3466	29 35 30	3456	30 56 43	3448
	Antares	E.	49 15 34	3082	47 47 2	3080	46 18 28	3078	44 49 52	3077
	α Aquilæ	E.	101 15 15	3469	99 54 16	3462	98 33 9	3454	97 11 53	3446
15	Sun	W.	37 45 10	3406	39 7 20	3398	40 29 39	3390	41 52 7	3381
	Antares	E.	37 26 22	3069	35 57 35	3069	34 28 47	3068	32 59 58	3069
	α Aquilæ	E.	90 23 40	3415	89 1 41	3410	87 39 36	3405	86 17 25	3400
16	Sun	W.	48 46 58	3336	50 10 28	3326	51 34 9	3317	52 58 1	3306
	Mars	W.	23 37 40	3231	25 3 12	3219	26 28 59	3207	27 55 0	3195
	Antares	E.	25 36 22	3086	24 7 55	3095	22 39 39	3108	21 11 39	3124
	α Aquilæ	E.	79 25 10	3379	78 2 30	3376	76 39 46	3373	75 16 59	3371
17	Sun	W.	60 0 26	3252	61 25 34	3239	62 50 57	3227	64 16 34	3214
	Mars	W.	35 8 39	3135	36 36 6	3123	38 3 48	3110	39 31 46	3097
	Spica	W.	32 50 18	2877	34 23 6	2866	35 56 8	2856	37 29 23	2845
	α Aquilæ	E.	68 22 32	3366	66 59 37	3366	65 36 42	3368	64 13 49	3371
18	Sun	W.	71 28 29	3148	72 55 41	3133	74 23 10	3119	75 50 57	3103
	Mars	W.	46 55 35	3030	48 25 11	3015	49 55 5	3001	51 25 17	2985
	Spica	W.	45 19 26	2784	46 54 15	2771	48 29 21	2758	50 4 44	2744
	Venus	W.	25 27 17	3153	26 54 22	3138	28 21 45	3124	29 49 26	3108
	α Aquilæ	E.	57 20 32	3400	55 58 16	3411	54 36 12	3423	53 14 22	3438
	Fomalhaut	E.	85 39 10	3257	84 14 8	3247	82 48 54	3237	81 23 29	3228
19	Sun	W.	83 14 36	3024	84 44 19	3008	86 14 22	2990	87 44 47	2973
	Mars	W.	59 1 3	2908	60 33 12	2891	62 5 42	2874	63 38 34	2858
	Spica	W.	58 6 20	2672	59 43 38	2656	61 21 17	2640	62 59 17	2625
	Venus	W.	37 12 42	3026	38 42 22	3009	40 12 23	2993	41 42 45	2975
	α Aquilæ	E.	46 30 22	3558	45 11 2	3594	43 52 21	3636	42 34 26	3685
	Fomalhaut	E.	74 13 45	3187	72 47 20	3181	71 20 48	3176	69 54 10	3172
20	Sun	W.	95 22 19	2885	96 54 57	2866	98 27 59	2848	100 1 25	2829
	Mars	W.	71 28 24	2770	73 3 31	2753	74 39 1	2735	76 14 55	2716
	Spica	W.	71 14 44	2543	72 54 58	2525	74 35 36	2508	76 16 38	2492
	Venus	W.	49 20 12	2885	50 52 50	2866	52 25 52	2847	53 59 19	2828
	Antares	W.	26 21 1	2657	27 58 38	2629	29 36 54	2601	31 15 47	2575
	Fomalhaut	E.	62 40 6	3166	61 13 16	3170	59 46 31	3175	58 19 52	3183
	α Pegasi	E.	78 7 0	2700	76 30 20	2685	74 53 20	2671	73 16 1	2656
21	Sun	W.	107 54 39	2735	109 30 32	2717	111 6 49	2698	112 43 31	2679
	Spica	W.	84 47 50	2404	86 31 19	2386	88 15 14	2368	89 59 34	2351
	Venus	W.	61 52 45	2733	63 28 41	2713	65 5 3	2695	66 41 50	2675
	Antares	W.	39 38 41	2460	41 20 51	2438	43 3 21	2418	44 46 40	2397
	Fomalhaut	E.	51 9 55	3264	49 45 1	3291	48 20 39	3324	46 56 55	3363
	α Pegasi	E.	65 4 40	2589	63 25 30	2577	61 46 4	2566	60 6 23	2556
22	Sun	W.	120 53 18	2588	122 32 29	2571	124 12 4	2553	125 52 3	2537
	Spica	W.	98 47 33	2264	100 34 25	2248	102 21 41	2231	104 9 22	2215
	Venus	W.	74 52 11	2581	76 31 32	2564	78 11 17	2545	79 51 27	2528

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22	Antares	W.	46° 30′ 19″	2377	48° 14′ 27″	2357	49° 59′ 3″	2338	51° 44′ 7″	2319
	Fomalhaut	E.	45 33 56	3408	44 11 49	3462	42 50 42	3525	41 30 45	3597
	α Pegasi	E.	58 26 27	2546	56 46 18	2538	55 5 57	2530	53 25 25	2524
	α Arietis	E.	101 13 19	2383	99 29 20	2366	97 44 56	2348	96 0 6	2330
23	Sun	W.	127 32 25	2520	129 13 10	2504	130 54 18	2488	132 35 48	2472
	Venus	W.	81 32 1	2511	83 12 59	2494	84 54 21	2477	86 36 7	2460
	Antares	W.	60 36 15	2229	62 23 59	2212	64 12 8	2196	66 0 41	2180
	α Pegasi	E.	45 1 22	2519	43 20 35	2525	41 39 58	2535	39 59 34	2550
	α Arietis	E.	87 9 40	2247	85 22 23	2232	83 34 43	2216	81 46 40	2202
24	Venus	W.	95 10 31	2386	96 54 26	2373	98 38 40	2361	100 23 11	2348
	Antares	W.	75 9 12	2109	76 59 58	2096	78 51 4	2084	80 42 28	2072
	α Aquilæ	W.	32 17 16	3996	33 29 0	3799	34 44 3	3628	36 2 7	3480
	α Arietis	E.	72 41 13	2137	70 51 11	2126	69 0 51	2115	67 10 15	2106
	Aldebaran	E.	105 46 49	2095	103 55 42	2082	102 4 15	2070	100 12 30	2059
25	Antares	W.	90 3 36	2025	91 56 31	2017	93 49 38	2011	95 42 55	2005
	α Aquilæ	W.	43 8 20	2966	44 39 15	2895	46 11 40	2833	47 45 25	2777
	α Arietis	E.	57 54 1	2070	56 2 16	2066	54 10 25	2063	52 18 29	2061
	Saturn	E.	78 22 16	1995	76 28 34	1987	74 34 40	1981	72 40 36	1975
	Aldebaran	E.	90 49 41	2012	88 56 25	2005	87 2 58	1998	85 9 20	1992
26	α Aquilæ	W.	55 50 5	2579	57 29 29	2552	59 9 30	2528	60 50 4	2507
	α Arietis	E.	42 58 47	2073	41 7 6	2081	39 15 37	2090	37 24 23	2102
	Saturn	E.	63 8 20	1957	61 13 38	1956	59 18 55	1956	57 24 11	1956
	Aldebaran	E.	75 39 18	1975	73 45 4	1974	71 50 48	1974	69 56 32	1974
	Jupiter	E.	97 30 27	1989	95 36 35	1987	93 42 41	1987	91 48 47	1988
27	α Aquilæ	W.	69 18 46	2445	71 1 16	2440	72 43 54	2436	74 26 37	2434
	Fomalhaut	W.	43 6 16	3105	44 34 20	3035	46 3 49	2975	47 34 33	2924
	Saturn	E.	47 51 6	1971	45 56 46	1976	44 2 34	1982	42 8 32	1989
	Aldebaran	E.	60 25 51	1990	58 32 1	1996	56 38 20	2002	54 44 49	2009
	Jupiter	E.	82 19 48	2001	80 26 15	2006	78 32 50	2012	76 39 35	2019
	Pollux	E.	102 44 15	2061	100 52 16	2066	99 0 24	2071	97 8 40	2077
28	Fomalhaut	W.	55 21 55	2757	56 57 19	2738	58 33 9	2722	60 9 19	2710
	α Pegasi	W.	35 14 44	2501	36 55 56	2473	38 37 47	2451	40 20 9	2435
	Saturn	E.	32 41 32	2037	30 48 55	2049	28 56 37	2061	27 4 38	2075
	Aldebaran	E.	45 20 33	2059	43 28 31	2072	41 36 48	2085	39 45 25	2099
	Jupiter	E.	67 16 19	2063	65 24 23	2075	63 32 45	2086	61 41 25	2099
	Pollux	E.	87 52 46	2120	86 2 18	2132	84 12 7	2143	82 22 14	2157
29	Fomalhaut	W.	68 12 54	2691	69 49 46	2693	71 26 35	2698	73 3 17	2704
	α Pegasi	W.	48 56 3	2405	50 39 30	2407	52 22 55	2411	54 6 14	2417
	Jupiter	E.	52 29 48	2170	50 40 35	2186	48 51 46	2202	47 3 22	2219
	Pollux	E.	73 18 11	2233	71 30 33	2251	69 43 21	2269	67 56 36	2287
30	Fomalhaut	W.	81 4 3	2757	82 39 27	2772	84 14 31	2788	85 49 15	2805
	α Pegasi	W.	62 40 9	2465	64 22 12	2477	66 3 57	2491	67 45 23	2505
	Jupiter	E.	38 7 50	2310	36 22 5	2330	34 36 49	2349	32 52 1	2369
	Pollux	E.	59 10 1	2392	57 26 14	2415	55 43 0	2438	54 0 20	2462
	Sun	E.	134 31 47	2606	132 53 0	2624	131 14 38	2643	129 36 42	2662

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	Antares	W.	53° 29′ 39″	2300	55° 15′ 38″	2282	57° 2′ 4″	2264	58° 48′ 57″	2247
	Fomalhaut	E.	40 12 7	3681	38 55 0	3781	37 39 38	3897	36 26 15	4032
	α Pegasi	E.	51 44 45	2519	50 3 58	2516	48 23 7	2515	46 42 14	2515
	α Arietis	E.	94 14 50	2313	92 29 9	2296	90 43 4	2279	88 56 34	2263
23	Sun	W.	134 17 40	2458	135 59 52	2444	137 42 24	2431	139 25 15	2417
	Venus	W.	88 18 17	2444	90 0 49	2429	91 43 42	2415	93 26 56	2400
	Antares	W.	67 49 38	2165	69 38 58	2150	71 28 41	2136	73 18 46	2122
	α Pegasi	E.	38 19 29	2569	36 39 51	2593	35 0 46	2624	33 22 24	2665
	α Arietis	E.	79 58 15	2188	78 9 29	2174	76 20 23	2161	74 30 57	2149
24	Venus	W.	102 8 0	2337	103 53 6	2326	105 38 27	2316	107 24 3	2307
	Antares	W.	82 34 10	2061	84 26 9	2051	86 18 24	2042	88 10 53	2033
	α Aquilæ	W.	37 22 54	3350	38 46 8	3236	40 11 35	3134	41 39 3	3045
	α Arietis	E.	65 19 25	2097	63 28 21	2089	61 37 5	2082	59 45 38	2075
	Aldebaran	E.	98 20 28	2048	96 28 9	2038	94 35 34	2028	92 42 44	2020
25	Antares	W.	97 36 21	2000	99 29 55	1996	101 23 35	1993	103 17 21	1991
	α Aquilæ	W.	49 20 23	2728	50 56 26	2684	52 33 28	2644	54 11 23	2610
	α Arietis	E.	50 26 30	2061	48 34 30	2062	46 42 32	2064	44 50 37	2067
	Saturn	E.	70 46 23	1970	68 52 2	1965	66 57 33	1962	65 2 59	1959
	Aldebaran	E.	83 15 33	1987	81 21 38	1982	79 27 36	1979	77 33 29	1977
26	α Aquilæ	W.	62 31 7	2490	64 12 34	2475	65 54 22	2463	67 36 27	2453
	α Arietis	E.	35 33 27	2117	33 42 54	2136	31 52 49	2157	30 3 17	2184
	Saturn	E.	55 29 27	1957	53 34 45	1959	51 40 6	1963	49 45 33	1967
	Aldebaran	E.	68 2 16	1975	66 8 2	1977	64 13 52	1981	62 19 48	1966
	Jupiter	E.	89 54 54	1989	88 1 2	1991	86 7 13	1993	84 13 28	1996
27	α Aquilæ	W.	76 9 23	2435	77 52 8	2437	79 34 50	2441	81 17 27	2446
	Fomalhaut	W.	49 6 22	2879	50 39 8	2841	52 12 43	2808	53 47 1	2780
	Saturn	E.	40 14 41	1998	38 21 3	2006	36 27 38	2015	34 34 27	2025
	Aldebaran	E.	52 51 29	2017	50 58 22	2027	49 5 30	2037	47 12 53	2048
	Jupiter	E.	74 46 30	2026	72 53 37	2035	71 0 57	2044	69 8 31	2053
	Pollux	E.	95 17 5	2084	93 25 41	2092	91 34 29	2100	89 43 30	2110
28	Fomalhaut	W.	61 45 45	2701	63 22 23	2695	64 59 9	2691	66 36 1	2690
	α Pegasi	W.	42 2 54	2422	43 45 57	2413	45 29 13	2408	47 12 36	2405
	Saturn	E.	25 13 0	2090	23 21 45	2105	21 30 54	2122	19 40 29	2141
	Aldebaran	E.	37 54 24	2115	36 3 47	2130	34 13 34	2147	32 23 47	2166
	Jupiter	E.	59 50 24	2112	57 59 43	2126	56 9 23	2139	54 19 24	2155
	Pollux	E.	80 32 42	2171	78 43 31	2185	76 54 41	2200	75 6 14	2216
29	Fomalhaut	W.	74 39 51	2713	76 16 14	2722	77 52 25	2732	79 28 22	2744
	α Pegasi	W.	55 49 25	2424	57 32 26	2432	59 15 15	2442	60 57 50	2453
	Jupiter	E.	45 15 23	2237	43 27 50	2254	41 40 43	2272	39 54 3	2291
	Pollux	E.	66 10 18	2307	64 24 28	2327	62 39 8	2348	60 54 19	2370
30	Fomalhaut	W.	87 23 37	2821	88 57 37	2840	90 31 13	2859	92 4 24	2879
	α Pegasi	W.	69 26 29	2520	71 7 14	2535	72 47 38	2551	74 27 41	2566
	Jupiter	E.	31 7 42	2390	29 23 53	2412	27 40 35	2433	25 57 48	2455
	Pollux	E.	52 18 14	2487	50 36 43	2514	48 55 49	2540	47 15 32	2568
	Sun	E.	127 59 11	2682	126 22 7	2701	124 45 29	2721	123 9 17	2741

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	12 30 5.10	9.056	S. 3 15 0.9	−58.23	16 1.52	64.38	10 21.10	0.799
Mon.	2	12 33 42.60	9.069	3 38 17.7	58.15	16 1.79	64.42	10 40.09	0.786
Tues.	3	12 37 20.42	9.083	4 1 32.1	58.05	16 2.06	64.47	10 58.76	0.772
Wed.	4	12 40 58.60	9.099	4 24 43.9	−57.92	16 2.33	64.52	11 17.09	0.756
Thur.	5	12 44 37.15	9.114	4 47 52.4	57.78	16 2.60	64.57	11 35.04	0.741
Frid.	6	12 48 16.10	9.131	5 10 57.5	57.63	16 2.87	64.62	11 52.60	0.724
Sat.	7	12 51 55.46	9.149	5 33 58.6	−57.46	16 3.14	64.68	12 9.74	0.706
SUN.	8	12 55 35.25	9.167	5 56 55.7	57.27	16 3.41	64.76	12 26.45	0.688
Mon.	9	12 59 15.48	9.186	6 19 48.2	57.08	16 3.69	64.81	12 42.73	0.669
Tues.	10	13 2 56.17	9.206	6 42 35.7	−56.87	16 3.96	64.87	12 58.55	0.649
Wed.	11	13 6 37.34	9.226	7 5 17.9	56.64	16 4.24	64.94	13 13.88	0.629
Thur.	12	13 10 19.01	9.246	7 27 54.2	56.39	16 4.51	65.01	13 28.72	0.608
Frid.	13	13 14 1.20	9.268	7 50 24.5	−56.12	16 4.79	65.09	13 43.05	0.586
Sat.	14	13 17 43.91	9.290	8 12 48.1	55.83	16 5.06	65.17	13 56.86	0.565
SUN.	15	13 21 27.15	9.313	8 35 4.8	55.54	16 5.34	65.25	14 10.14	0.542
Mon.	16	13 25 10.94	9.336	8 57 14.1	−55.22	16 5.61	65.33	14 22.86	0.519
Tues.	17	13 28 55.30	9.360	9 19 15.8	54.89	16 5.89	65.42	14 35.02	0.495
Wed.	18	13 32 40.24	9.384	9 41 9.3	54.56	16 6.17	65.51	14 46.60	0.471
Thur.	19	13 36 25.78	9.409	10 2 54.3	−54.19	16 6.45	65.60	14 57.59	0.446
Frid.	20	13 40 11.94	9.435	10 24 30.4	53.81	16 6.73	65.69	15 7.95	0.420
Sat.	21	13 43 58.73	9.462	10 45 57.2	53.42	16 7.00	65.79	15 17.69	0.393
SUN.	22	13 47 46.16	9.489	11 7 14.3	−53.00	16 7.27	65.89	15 26.79	0.366
Mon.	23	13 51 34.26	9.518	11 28 21.3	52.57	16 7.55	65.99	15 35.23	0.338
Tues.	24	13 55 23.03	9.547	11 49 18.0	52.13	16 7.82	66.09	15 42.99	0.309
Wed.	25	13 59 12.50	9.577	12 10 3.8	−51.67	16 8.08	66.20	15 50.06	0.279
Thur.	26	14 3 2.67	9.606	12 30 38.3	51.19	16 8.34	66.30	15 56.41	0.250
Frid.	27	14 6 53.59	9.637	12 51 1.3	50.71	16 8.60	66.41	16 2.02	0.219
Sat.	28	14 10 45.27	9.669	13 11 12.4	−50.20	16 8.86	66.52	16 6.88	0.187
SUN.	29	14 14 37.72	9.701	13 31 11.1	49.68	16 9.11	66.63	16 10.98	0.155
Mon.	30	14 18 30.94	9.734	13 50 57.0	49.13	16 9.36	66.74	16 14.31	0.122
Tues.	31	14 22 24.96	9.767	14 10 29.6	48.57	16 9.61	66.85	16 16.85	0.089
Wed.	32	14 26 19.78	9.801	S. 14 29 48.8	−48.00	16 9.85	66.96	16 18.58	0.055

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sun.	1	12 30 6.65	9.058	S. 3 15 11.0	-58.26	10 21.23	0.799	12 40 27.88
Mon.	2	12 33 44.21	9.071	3 38 28.1	58.16	10 40.22	0.786	12 44 24.43
Tues.	3	12 37 22.08	9.085	4 1 42.7	58.06	10 58.90	0.772	12 48 20.98
Wed.	4	12 41 0.31	9.101	4 24 54.7	-57.93	11 17.23	0.756	12 52 17.54
Thur.	5	12 44 38.91	9.116	4 48 3.5	57.79	11 35.18	0.741	12 56 14.09
Frid.	6	12 48 17.91	9.133	5 11 8.9	57.64	11 52.74	0.724	13 0 10.65
Sat.	7	12 51 57.32	9.151	5 34 10.3	-57.47	12 9.87	0.706	13 4 7.19
Sun.	8	12 55 37.16	9.169	5 57 7.6	57.28	12 26.59	0.688	13 8 3.75
Mon.	9	12 59 17.43	9.188	6 20 0.3	57.10	12 42.87	0.669	13 12 0.30
Tues.	10	13 2 58.17	9.208	6 42 47.9	-56.88	12 58.69	0.651	13 15 56.86
Wed.	11	13 6 39.38	9.228	7 5 30.4	56.64	13 14.02	0.629	13 19 53.40
Thur.	12	13 10 21.09	9.248	7 28 6.9	56.40	13 28.87	0.608	13 23 49.96
Frid.	13	13 14 3.32	9.270	7 50 37.3	-56.13	13 43.19	0.587	13 27 46.51
Sat.	14	13 17 46.07	9.292	8 13 1.1	55.84	13 57.00	0.565	13 31 43.07
Sun.	15	13 21 29.35	9.315	8 35 17.9	55.55	14 10.27	0.542	13 35 39.62
Mon.	16	13 25 13.18	9.338	8 57 27.3	-55.23	14 22.99	0.519	13 39 36.17
Tues.	17	13 28 57.58	9.362	9 19 29.1	54.90	14 35.14	0.495	13 43 32.72
Wed.	18	13 32 42.56	9.386	9 41 22.7	54.56	14 46.72	0.471	13 47 29.28
Thur.	19	13 36 28.13	9.411	10 3 7.8	-54.19	14 57.70	0.446	13 51 25.83
Frid.	20	13 40 14.32	9.437	10 24 44.0	53.81	15 8.06	0.420	13 55 22.38
Sat.	21	13 44 1.14	9.464	10 46 10.8	53.42	15 17.79	0.393	13 59 18.93
Sun.	22	13 47 48.60	9.491	11 7 28.0	-53.00	15 26.88	0.366	14 3 15.48
Mon.	23	13 51 36.73	9.519	11 28 35.0	52.57	15 35.31	0.338	14 7 12.04
Tues.	24	13 55 25.53	9.548	11 49 31.7	52.13	15 43.07	0.309	14 11 8.60
Wed.	25	13 59 15.03	9.578	12 10 17.4	-51.67	15 50.13	0.279	14 15 5.16
Thur.	26	14 3 5.23	9.607	12 30 51.9	51.19	15 56.47	0.250	14 19 1.70
Frid.	27	14 6 56.19	9.638	12 51 15.0	50.71	16 2.07	0.219	14 22 58.26
Sat.	28	14 10 47.87	9.670	13 11 25.9	-50.20	16 6.94	0.187	14 26 54.81
Sun.	29	14 14 40.34	9.702	13 31 24.5	49.68	16 11.02	0.155	14 30 51.36
Mon.	30	14 18 33.58	9.735	13 51 10.3	49.13	16 14.34	0.122	14 34 47.92
Tues.	31	14 22 27.61	9.768	14 10 42.8	48.57	16 16.87	0.089	14 38 44.48
Wed.	32	14 26 22.44	9.802	S. 14 30 1.9	-48.00	16 18.59	0.055	14 42 41.03

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE.		THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	274	188 12 9.1	11 17.7	147.63	− 0.35	0.0002184	− 51.1	11 17 40.79
2	275	189 11 13.4	10 21.9	147.72	0.48	0.0000959	51.0	11 13 44.89
3	276	190 10 20.0	9 28.5	147.82	0.60	9.9999736	51.0	11 9 48.98
4	277	191 9 28.9	8 37.3	147.92	− 0.70	9.9998513	− 51.0	11 5 53.07
5	278	192 8 40.2	7 48.5	148.02	0.77	9.9997290	51.0	11 1 57.16
6	279	193 7 53.8	7 2.0	148.12	0.82	9.9996066	51.0	10 58 1.27
7	280	194 7 9.7	6 17.8	148.21	− 0.83	9.9994842	− 51.1	10 54 5.36
8	281	195 6 27.8	5 35.8	148.31	0.82	9.9993616	51.2	10 50 9.45
9	282	196 5 48.1	4 56.1	148.40	0.78	9.9992386	51.3	10 46 13.54
10	283	197 5 10.8	4 18.7	148.49	− 0.70	9.9991152	− 51.4	10 42 17.64
11	284	198 4 35.7	3 43.5	148.58	0.62	9.9989914	51.6	10 38 21.73
12	285	199 4 2.7	3 10.4	148.67	0.50	9.9988671	51.7	10 34 25.82
13	286	200 3 31.7	2 39.3	148.75	− 0.37	9.9987426	− 51.9	10 30 29.91
14	287	201 3 2.5	2 10.0	148.83	0.22	9.9986178	52.0	10 26 34.01
15	288	202 2 35.2	1 42.6	148.90	− 0.09	9.9984928	52.1	10 22 38.10
16	289	203 2 9.8	1 17.1	148.98	+ 0.04	9.9983679	− 52.1	10 18 42.19
17	290	204 1 46.3	0 53.5	149.06	0.15	9.9982430	52.0	10 14 46.28
18	291	205 1 24.6	0 31.7	149.13	0.25	9.9981182	51.9	10 10 50.38
19	292	206 1 4.6	0 11.6	149.20	+ 0.32	9.9979938	− 51.7	10 6 54.47
20	293	206 60 46.2	59 53.1	149.27	0.35	9.9978699	51.5	10 2 58.56
21	294	207 60 29.5	59 36.3	149.34	0.36	9.9977467	51.2	9 59 2.65
22	295	208 60 14.6	59 21.3	149.41	+ 0.35	9.9976243	− 50.8	9 55 6.75
23	296	209 60 1.4	59 8.0	149.48	0.31	9.9975029	50.3	9 51 10.84
24	297	210 59 49.9	58 56.4	149.56	0.23	9.9973828	49.8	9 47 14.93
25	298	211 59 40.2	58 46.6	149.63	+ 0.14	9.9972638	− 49.3	9 43 19.02
26	299	212 59 32.4	58 38.7	149.71	+ 0.02	9.9971461	48.7	9 39 23.12
27	300	213 59 26.5	58 32.7	149.79	− 0.10	9.9970298	48.1	9 35 27.21
28	301	214 59 22.6	58 28.7	149.88	− 0.24	9.9969150	− 47.5	9 31 31.30
29	302	215 59 20.7	58 26.7	149.96	0.37	9.9968016	46.9	9 27 35.39
30	303	216 59 20.8	58 26.7	150.05	0.48	9.9966896	46.3	9 23 39.48
31	304	217 59 22.9	58 28.7	150.13	0.59	9.9965789	45.8	9 19 43.57
32	305	218 59 27.2	58 32.8	150.22	− 0.66	9.9964697	− 45.2	9 15 47.66

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 56.9	15 48.9	58 25.0	-2.45	57 55.7	-2.43	16 16.2	2.31	18.9
2	15 41.1	15 33.5	57 26.9	2.37	56 59.1	2.26	17 10.6	2.21	19.9
3	15 26.3	15 19.6	56 32.8	2.12	56 8.2	1.97	18 2.4	2.10	20.9
4	15 13.4	15 7.8	55 45.5	-1.81	55 24.9	-1.62	18 51.3	1.98	21.9
5	15 2.9	14 58.5	55 6.6	1.43	54 50.5	1.25	19 37.6	1.88	22.9
6	14 54.7	14 51.6	54 36.7	1.06	54 25.1	0.87	20 21.7	1.80	23.9
7	14 49.0	14 47.0	54 15.7	-0.69	54 8.4	-0.51	21 4.3	1.75	24.9
8	14 45.6	14 44.7	54 3.2	0.36	53 59.8	-0.21	21 45.9	1.73	25.9
9	14 44.2	14 44.3	53 58.2	-0.06	53 58.3	+0.07	22 27.4	1.74	26.9
10	14 44.7	14 45.5	53 59.9	+0.20	54 3.0	+0.32	23 9.4	1.77	27.9
11	14 46.7	14 48.3	54 7.4	0.42	54 13.0	0.52	23 52.7	1.83	28.9
12	14 50.1	14 52.3	54 19.8	0.62	54 27.8	0.71	δ		0.2
13	14 54.7	14 57.5	54 36.8	+0.80	54 46.9	+0.88	0 37.6	1.91	1.2
14	15 0.5	15 3.8	54 58.0	0.97	55 10.2	1.07	1 24.5	2.00	2.2
15	15 7.5	15 11.4	55 23.6	1.16	55 38.0	1.25	2 13.5	2.09	3.2
16	15 15.6	15 20.2	55 53.6	+1.35	56 10.3	+1.44	3 4.5	2.16	4.2
17	15 25.1	15 30.2	56 28.2	1.54	56 47.2	1.62	3 57.0	2.21	5.2
18	15 35.7	15 41.4	57 7.1	1.70	57 28.0	1.77	4 50.2	2.22	6.2
19	15 47.2	15 53.3	57 49.6	+1.83	58 11.8	+1.86	5 43.7	2.22	7.2
20	15 59.4	16 5.5	58 34.2	1.87	58 56.6	1.85	6 36.9	2.21	8.2
21	16 11.4	16 17.1	59 18.5	1.78	59 39.4	1.68	7 29.9	2.20	9.2
22	16 22.4	16 27.1	59 58.8	+1.53	60 16.1	+1.33	8 22.8	2.21	10.2
23	16 31.1	16 34.2	60 30.7	1.09	60 42.2	0.81	9 16.1	2.24	11.2
24	16 36.4	16 37.4	60 50.0	+0.49	60 53.8	+0.15	10 10.5	2.30	12.2
25	16 37.3	16 35.9	60 53.4	-0.22	60 48.5	-0.59	11 6.4	2.36	13.2
26	16 33.4	16 29.8	60 39.3	0.94	60 26.0	1.27	12 3.8	2.42	14.2
27	16 25.2	16 19.6	60 8.9	1.57	59 48.4	1.83	13 2.3	2.44	15.2
28	16 13.2	16 6.3	59 25.0	-2.04	58 59.5	-2.18	14 0.8	2.41	16.2
29	15 58.9	15 51.4	58 32.6	2.28	58 4.8	2.33	14 57.9	2.33	17.2
30	15 43.7	15 36.2	57 36.8	2.32	57 9.1	2.27	15 52.6	2.21	18.2
31	15 28.9	15 22.0	56 42.4	2.18	56 17.0	2.05	16 44.1	2.08	19.2
32	15 15.6	15 9.7	55 53.4	-1.89	55 31.8	-1.71	17 32.4	1.95	20.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SUNDAY 1.					**TUESDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 20 5.38	2.4332	N.20 4 59.8	2.812	0	6 13 25.46	2.2714	N.19 57 42.9	2.914
1	4 22 31.31	2.4310	20 7 44.6	2.682	1	6 15 41.62	2.2671	19 54 44.9	3.018
2	4 24 57.10	2.4288	20 10 21.7	2.553	2	6 17 57.51	2.2627	19 51 40.7	3.121
3	4 27 22.76	2.4265	20 12 51.0	2.424	3	6 20 13.14	2.2583	19 48 30.4	3.223
4	4 29 48.28	2.4242	20 15 12.6	2.296	4	6 22 28.51	2.2540	19 45 13.9	3.326
5	4 32 13.66	2.4218	20 17 26.5	2.168	5	6 24 43.62	2.2496	19 41 51.3	3.428
6	4 34 38.90	2.4194	20 19 32.8	2.041	6	6 26 58.46	2.2452	19 38 22.6	3.528
7	4 37 3.99	2.4169	20 21 31.4	1.912	7	6 29 13.04	2.2408	19 34 47.9	3.627
8	4 39 28.93	2.4143	20 23 22.3	1.784	8	6 31 27.36	2.2364	19 31 7.3	3.726
9	4 41 53.71	2.4117	20 25 5.5	1.657	9	6 33 41.41	2.2319	19 27 20.8	3.824
10	4 44 18.33	2.4090	20 26 41.1	1.530	10	6 35 55.19	2.2275	19 23 28.4	3.922
11	4 46 42.79	2.4063	20 28 9.1	1.404	11	6 38 8.71	2.2231	19 19 30.1	4.020
12	4 49 7.09	2.4036	20 29 29.6	1.278	12	6 40 21.96	2.2186	19 15 26.0	4.116
13	4 51 31.22	2.4007	20 30 42.5	1.152	13	6 42 34.94	2.2141	19 11 16.2	4.210
14	4 53 55.17	2.3977	20 31 47.9	1.027	14	6 44 47.65	2.2097	19 7 0.8	4.304
15	4 56 18.94	2.3947	20 32 45.7	0.902	15	6 47 0.10	2.2052	19 2 39.7	4.397
16	4 58 42.53	2.3917	20 33 36.1	0.777	16	6 49 12.28	2.2007	18 58 13.1	4.490
17	5 1 5.94	2.3887	20 34 19.0	0.652	17	6 51 24.19	2.1961	18 53 40.9	4.582
18	5 3 29.17	2.3856	20 34 54.4	0.529	18	6 53 35.82	2.1916	18 49 3.2	4.673
19	5 5 52.21	2.3823	20 35 22.4	0.406	19	6 55 47.18	2.1872	18 44 20.1	4.763
20	5 8 15.05	2.3790	20 35 43.1	0.283	20	6 57 58.28	2.1827	18 39 31.6	4.852
21	5 10 37.69	2.3758	20 35 56.4	0.161	21	7 0 9.11	2.1782	18 34 37.8	4.942
22	5 13 0.14	2.3725	20 36 2.4	+ 0.039	22	7 2 19.67	2.1737	18 29 38.6	5.031
23	5 15 22.39	2.3691	N.20 36 1.1	− 0.082	23	7 4 29.96	2.1692	N.18 24 34.1	5.118
	MONDAY 2.					**WEDNESDAY 4**			
0	5 17 44.43	2.3657	N.20 35 52.5	0.203	0	7 6 39.98	2.1647	N.18 19 24.4	5.204
1	5 20 6.27	2.3622	20 35 36.7	0.323	1	7 8 49.73	2.1602	18 14 9.6	5.289
2	5 22 27.89	2.3586	20 35 13.7	0.443	2	7 10 59.21	2.1558	18 8 49.7	5.374
3	5 24 49.30	2.3551	20 34 43.5	0.562	3	7 13 8.43	2.1514	18 3 24.7	5.458
4	5 27 10.50	2.3515	20 34 6.2	0.680	4	7 15 17.38	2.1469	17 57 54.7	5.541
5	5 29 31.48	2.3478	20 33 21.9	0.797	5	7 17 26.06	2.1425	17 52 19.8	5.623
6	5 31 52.23	2.3440	20 32 30.5	0.915	6	7 19 34.48	2.1381	17 46 39.9	5.705
7	5 34 12.76	2.3402	20 31 32.1	1.032	7	7 21 42.63	2.1336	17 40 55.2	5.785
8	5 36 33.06	2.3365	20 30 26.7	1.148	8	7 23 50.51	2.1292	17 35 5.7	5.865
9	5 38 53.14	2.3327	20 29 14.3	1.264	9	7 25 58.14	2.1248	17 29 11.4	5.945
10	5 41 12.99	2.3288	20 27 55.0	1.378	10	7 28 5.49	2.1204	17 23 12.3	6.024
11	5 43 32.60	2.3249	20 26 28.9	1.492	11	7 30 12.58	2.1160	17 17 8.5	6.102
12	5 45 51.98	2.3210	20 24 56.0	1.605	12	7 32 19.41	2.1117	17 11 0.1	6.178
13	5 48 11.12	2.3170	20 23 16.3	1.718	13	7 34 25.98	2.1073	17 4 47.2	6.253
14	5 50 30 02	2.3130	20 21 29.8	1.831	14	7 36 32.29	2.1030	16 58 29.7	6.329
15	5 52 48.68	2.3090	20 19 36.6	1.942	15	7 38 38.34	2.0987	16 52 7.7	6.404
16	5 55 7.10	2.3049	20 17 36.7	2.053	16	7 40 44.14	2.0945	16 45 41.2	6.477
17	5 57 25.27	2.3008	20 15 30.2	2.163	17	7 42 49.68	2.0902	16 39 10.4	6.550
18	5 59 43.19	2.2967	20 13 17.2	2.272	18	7 44 54.96	2.0859	16 32 35.2	6.622
19	6 2 0.87	2.2925	20 10 57.6	2.381	19	7 46 59.99	2.0817	16 25 55.7	6.693
20	6 4 18.29	2.2883	20 8 31.5	2.489	20	7 49 4.77	2.0776	16 19 12.0	6.764
21	6 6 35.46	2.2841	20 5 58.9	2.597	21	7 51 9.30	2.0734	16 12 24.0	6.835
22	6 8 52.38	2.2799	20 3 19.9	2.703	22	7 53 13.57	2.0692	16 5 31.8	6.904
23	6 11 9.05	2.2757	20 0 34.6	2.808	23	7 55 17.60	2.0651	15 58 35.5	6.972
24	6 13 25.46	2.2714	N.19 57 42.9	2.914	24	7 57 21.38	2.0609	N.15 51 35.2	7.039

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 5.					SATURDAY 7.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 57 21.38	2.0609	N.15 51 35.2	7.039	0	9 32 9.27	1.9033	N. 9 9 40.5	9.441
1	7 59 24.91	2.0568	15 44 30.8	7.106	1	9 34 3.40	1.9010	9 0 13.0	9.474
2	8 1 28.20	2.0528	15 37 22.5	7.172	2	9 35 57.39	1.8987	8 50 43.6	9.507
3	8 3 31.25	2.0488	15 30 10.2	7.237	3	9 37 51.25	1.8965	8 41 12.2	9.539
4	8 5 34.06	2.0448	15 22 54.0	7.302	4	9 39 44.97	1.8943	8 31 38.9	9.571
5	8 7 36.63	2.0408	15 15 34.0	7.366	5	9 41 38.57	1.8922	8 22 3.7	9.602
6	8 9 38.96	2.0368	15 8 10.1	7.429	6	9 43 32.04	1.8902	8 12 26.6	9.632
7	8 11 41.05	2.0329	15 0 42.5	7.491	7	9 45 25.39	1.8882	8 2 47.8	9.662
8	8 13 42.91	2.0291	14 53 11.2	7.553	8	9 47 18.62	1.8861	7 53 7.2	9.692
9	8 15 44.54	2.0252	14 45 36.2	7.614	9	9 49 11.72	1.8841	7 43 24.8	9.721
10	8 17 45.94	2.0214	14 37 57.5	7.674	10	9 51 4.71	1.8822	7 33 40.7	9.748
11	8 19 47.11	2.0176	14 30 15.3	7.733	11	9 52 57.59	1.8804	7 23 55.0	9.775
12	8 21 48.05	2.0138	14 22 29.6	7.791	12	9 54 50.36	1.8786	7 14 7.7	9.802
13	8 23 48.77	2.0101	14 14 40.4	7.849	13	9 56 43.02	1.8769	7 4 18.8	9.828
14	8 25 49.26	2.0064	14 6 47.7	7.907	14	9 58 35.58	1.8752	6 54 28.3	9.854
15	8 27 49.53	2.0028	13 58 51.6	7.963	15	10 0 28.04	1.8735	6 44 36.3	9.878
16	8 29 49.59	1.9992	13 50 52.1	8.019	16	10 2 20.40	1.8718	6 34 42.9	9.902
17	8 31 49.43	1.9955	13 42 49.3	8.074	17	10 4 12.66	1.8702	6 24 48.0	9.926
18	8 33 49.05	1.9919	13 34 43.2	8.128	18	10 6 4.82	1.8686	6 14 51.7	9.949
19	8 35 48.46	1.9884	13 26 33.9	8.182	19	10 7 56.89	1.8672	6 4 54.1	9.972
20	8 37 47.66	1.9850	13 18 21.4	8.235	20	10 9 48.88	1.8657	5 54 55.1	9.994
21	8 39 46.66	1.9816	13 10 5.7	8.287	21	10 11 40.78	1.8643	5 44 54.8	10.016
22	8 41 45.45	1.9781	13 1 46.9	8.338	22	10 13 32.60	1.8630	5 34 53.2	10.037
23	8 43 44.03	1.9747	N.12 53 25.1	8.389	23	10 15 24.34	1.8617	N. 5 24 50.4	10.056
FRIDAY 6.					SUNDAY 8.				
0	8 45 42.41	1.9713	N.12 45 0.2	8.440	0	10 17 16.00	1.8604	N. 5 14 46.5	10.075
1	8 47 40.59	1.9680	12 36 32.3	8.489	1	10 19 7.59	1.8592	5 4 41.4	10.094
2	8 49 38.57	1.9648	12 28 1.5	8.538	2	10 20 59.11	1.8581	4 54 35.2	10.112
3	8 51 36.36	1.9616	12 19 27.8	8.586	3	10 22 50.56	1.8569	4 44 28.0	10.129
4	8 53 33.96	1.9584	12 10 51.2	8.633	4	10 24 41.94	1.8558	4 34 19.7	10.147
5	8 55 31.37	1.9553	12 2 11.8	8.680	5	10 26 33.25	1.8547	4 24 10.4	10.163
6	8 57 28.59	1.9522	11 53 29.6	8.726	6	10 28 24.50	1.8537	4 14 0.1	10.179
7	8 59 25.63	1.9491	11 44 44.7	8.771	7	10 30 15.70	1.8528	4 3 48.9	10.194
8	9 1 22.48	1.9460	11 35 57.1	8.816	8	10 32 6.84	1.8519	3 53 36.8	10.209
9	9 3 19.15	1.9430	11 27 6.8	8.860	9	10 33 57.93	1.8511	3 43 23.8	10.223
10	9 5 15.64	1.9401	11 18 13.9	8.903	10	10 35 48.97	1.8503	3 33 10.0	10.237
11	9 7 11.96	1.9372	11 9 18.4	8.946	11	10 37 39.96	1.8495	3 22 55.4	10.249
12	9 9 8.10	1.9343	11 0 20.4	8.988	12	10 39 30.91	1.8488	3 12 40.1	10.261
13	9 11 4.07	1.9315	10 51 19.9	9.029	13	10 41 21.82	1.8482	3 2 24.1	10.272
14	9 12 59.88	1.9287	10 42 16.9	9.070	14	10 43 12.69	1.8475	2 52 7.4	10.284
15	9 14 55.52	1.9260	10 33 11.5	9.110	15	10 45 3.52	1.8469	2 41 50.0	10.295
16	9 16 51.00	1.9233	10 24 3.7	9.149	16	10 46 54.32	1.8464	2 31 32.0	10.304
17	9 18 46.32	1.9207	10 14 53.6	9.188	17	10 48 45.09	1.8459	2 21 13.5	10.313
18	9 20 41.48	1.9181	10 5 41.2	9.226	18	10 50 35.83	1.8455	2 10 54.4	10.322
19	9 22 36.49	1.9155	9 56 26.5	9.263	19	10 52 26.55	1.8452	2 0 34.8	10.330
20	9 24 31.34	1.9129	9 47 9.6	9.300	20	10 54 17.25	1.8448	1 50 14.8	10.337
21	9 26 26.04	1.9104	9 37 50.5	9.337	21	10 56 7.93	1.8445	1 39 54.4	10.343
22	9 28 20.59	1.9080	9 28 29.2	9.372	22	10 57 58.59	1.8442	1 29 33.6	10.350
23	9 30 15.00	1.9057	9 19 5.9	9.406	23	10 59 49.23	1.8439	1 19 12.4	10.356
24	9 32 9.27	1.9033	N. 9 9 40.5	9.441	24	11 1 39.86	1.8438	N. 1 8 50.9	10.361

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 9.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 1 39.86	1.8438	N. 1 8 50.9	10.361
1	11 3 30.49	1.8437	0 58 29.1	10.365
2	11 5 21.11	1.8437	0 48 7.1	10.368
3	11 7 11.73	1.8437	0 37 44.9	10.371
4	11 9 2.35	1.8437	0 27 22.5	10.374
5	11 10 52.97	1.8437	0 17 0.0	10.377
6	11 12 43.59	1.8438	N. 0 6 37.3	10.378
7	11 14 34.22	1.8439	S. 0 3 45.4	10.378
8	11 16 24.86	1.8442	0 14 8.1	10.378
9	11 18 15.52	1.8444	0 24 30.8	10.378
10	11 20 6.19	1.8447	0 34 53.4	10.377
11	11 21 56.88	1.8451	0 45 16.0	10.376
12	11 23 47.60	1.8455	0 55 38.5	10.373
13	11 25 38.34	1.8458	1 6 0.8	10.370
14	11 27 29.10	1.8462	1 16 22.9	10.367
15	11 29 19.89	1.8467	1 26 44.8	10.362
16	11 31 10.71	1.8473	1 37 6.4	10.357
17	11 33 1.57	1.8480	1 47 27.7	10.352
18	11 34 52.47	1.8487	1 57 48.6	10.346
19	11 36 43.41	1.8493	2 8 9.2	10.339
20	11 38 34.39	1.8500	2 18 29.3	10.332
21	11 40 25.41	1.8507	2 28 49.0	10.324
22	11 42 16.48	1.8516	2 39 8.2	10.316
23	11 44 7.60	1.8524	S. 2 49 26.9	10.307

TUESDAY 10.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 45 58.77	1.8533	S. 2 59 45.0	10.297
1	11 47 50.00	1.8543	3 10 2.5	10.286
2	11 49 41.29	1.8552	3 20 19.3	10.275
3	11 51 32.63	1.8562	3 30 35.5	10.263
4	11 53 24.04	1.8573	3 40 50.9	10.251
5	11 55 15.51	1.8584	3 51 5.6	10.238
6	11 57 7.05	1.8596	4 1 19.5	10.224
7	11 58 58.66	1.8608	4 11 32.5	10.210
8	12 0 50.34	1.8620	4 21 44.7	10.196
9	12 2 42.10	1.8633	4 31 56.0	10.180
10	12 4 33.94	1.8647	4 42 6.3	10.163
11	12 6 25.86	1.8660	4 52 15.6	10.147
12	12 8 17.86	1.8674	5 2 23.9	10.129
13	12 10 9.95	1.8688	5 12 31.1	10.111
14	12 12 2.12	1.8702	5 22 37.2	10.092
15	12 13 54.38	1.8717	5 32 42.2	10.073
16	12 15 46.73	1.8733	5 42 46.0	10.053
17	12 17 39.18	1.8749	5 52 48.5	10.032
18	12 19 31.72	1.8765	6 2 49.8	10.011
19	12 21 24.36	1.8782	6 12 49.8	9.988
20	12 23 17.11	1.8800	6 22 48.4	9.965
21	12 25 9.96	1.8817	6 32 45.6	9.942
22	12 27 2.92	1.8835	6 42 41.4	9.918
23	12 28 55.98	1.8853	6 52 35.7	9.893
24	12 30 49.15	1.8872	S. 7 2 28.6	9.868

WEDNESDAY 11.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	12 30 49.15	1.8872	S. 7 2 28.6	9.868
1	12 32 42.44	1.8891	7 12 19.9	9.842
2	12 34 35.84	1.8910	7 22 9.6	9.815
3	12 36 29.36	1.8930	7 31 57.7	9.787
4	12 38 23.00	1.8950	7 41 44.1	9.759
5	12 40 16.76	1.8970	7 51 28.8	9.731
6	12 42 10.64	1.8991	8 1 11.8	9.702
7	12 44 4.65	1.9012	8 10 53.0	9.671
8	12 45 58.79	1.9034	8 20 32.3	9.639
9	12 47 53.06	1.9056	8 30 9.7	9.608
10	12 49 47.46	1.9078	8 39 45.2	9.576
11	12 51 41.99	1.9100	8 49 18.8	9.543
12	12 53 36.66	1.9123	8 58 50.4	9.509
13	12 55 31.47	1.9147	9 8 19.9	9.475
14	12 57 26.42	1.9171	9 17 47.4	9.441
15	12 59 21.52	1.9195	9 27 12.8	9.405
16	13 1 16.76	1.9218	9 36 36.0	9.368
17	13 3 12.14	1.9242	9 45 56.9	9.330
18	13 5 7.67	1.9267	9 55 15.6	9.292
19	13 7 3.35	1.9293	10 4 32.0	9.254
20	13 8 59.19	1.9319	10 13 46.1	9.215
21	13 10 55.18	1.9344	10 22 57.8	9.175
22	13 12 51.32	1.9370	10 32 7.1	9.134
23	13 14 47.62	1.9397	S. 10 41 13.9	9.093

THURSDAY 12.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	13 16 44.08	1.9423	S. 10 50 18.2	9.051
1	13 18 40.70	1.9450	10 59 20.0	9.008
2	13 20 37.48	1.9478	11 8 19.2	8.964
3	13 22 34.43	1.9506	11 17 15.7	8.919
4	13 24 31.55	1.9533	11 26 9.5	8.874
5	13 26 28.83	1.9561	11 35 0.6	8.829
6	13 28 26.28	1.9589	11 43 49.0	8.783
7	13 30 23.90	1.9618	11 52 34.6	8.736
8	13 32 21.70	1.9647	12 1 17.3	8.687
9	13 34 19.67	1.9676	12 9 57.1	8.638
10	13 36 17.81	1.9705	12 18 33.9	8.589
11	13 38 16.13	1.9735	12 27 7.8	8.540
12	13 40 14.63	1.9765	12 35 38.7	8.489
13	13 42 13.31	1.9795	12 44 6.5	8.437
14	13 44 12.17	1.9825	12 52 31.1	8.384
15	13 46 11.21	1.9855	13 0 52.6	8.332
16	13 48 10.43	1.9886	13 9 10.9	8.278
17	13 50 9.84	1.9917	13 17 26.0	8.224
18	13 52 9.43	1.9948	13 25 37.8	8.168
19	13 54 9.21	1.9979	13 33 46.2	8.112
20	13 56 9.18	2.0010	13 41 51.2	8.055
21	13 58 9.33	2.0042	13 49 52.8	7.998
22	14 0 9.68	2.0074	13 57 51.0	7.941
23	14 2 10.22	2.0106	14 5 45.7	7.889
24	14 4 10.95	2.0138	S. 14 13 36.8	7.832

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	14 4 10.95	2.0138	S. 14 13 36.8	7.822
1	14 6 11.88	2.0171	14 21 24.3	7.761
2	14 8 13.00	2.0203	14 29 8.1	7.700
3	14 10 14.31	2.0235	14 36 48.3	7.639
4	14 12 15.82	2.0268	14 44 24.8	7.576
5	14 14 17.53	2.0301	14 51 57.5	7.512
6	14 16 19.43	2.0334	14 59 26.3	7.448
7	14 18 21.53	2.0367	15 6 51.3	7.384
8	14 20 23.83	2.0400	15 14 12.4	7.318
9	14 22 26.33	2.0433	15 21 29.5	7.252
10	14 24 29.03	2.0467	15 28 42.6	7.185
11	14 26 31.93	2.0501	15 35 51.7	7.117
12	14 28 35.04	2.0535	15 42 56.7	7.049
13	14 30 38.35	2.0568	15 49 57.6	6.980
14	14 32 41.86	2.0602	15 56 54.3	6.910
15	14 34 45.57	2.0635	16 3 46.8	6.839
16	14 36 49.48	2.0669	16 10 35.0	6.768
17	14 38 53.60	2.0703	16 17 18.9	6.696
18	14 40 57.92	2.0737	16 23 58.5	6.623
19	14 43 2.45	2.0771	16 30 33.7	6.550
20	14 45 7.18	2.0805	16 37 4.5	6.476
21	14 47 12.11	2.0839	16 43 30.8	6.401
22	14 49 17.25	2.0873	16 49 52.6	6.325
23	14 51 22.59	2.0907	S. 16 56 9.8	6.248

SATURDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	14 53 28.13	2.0941	S. 17 2 22.4	6.172
1	14 55 33.88	2.0975	17 8 30.4	6.094
2	14 57 39.83	2.1009	17 14 33.7	6.015
3	14 59 45.99	2.1043	17 20 32.2	5.936
4	15 1 52.35	2.1077	17 26 26.0	5.857
5	15 3 58.91	2.1111	17 32 15.0	5.776
6	15 6 5.68	2.1145	17 37 59.1	5.694
7	15 8 12.65	2.1178	17 43 38.3	5.612
8	15 10 19.82	2.1212	17 49 12.6	5.530
9	15 12 27.19	2.1245	17 54 41.9	5.447
10	15 14 34.76	2.1279	18 0 6.2	5.363
11	15 16 42.54	2.1313	18 5 25.4	5.278
12	15 18 50.52	2.1347	18 10 39.5	5.193
13	15 20 58.70	2.1379	18 15 48.5	5.106
14	15 23 7.07	2.1412	18 20 52.3	5.019
15	15 25 15.64	2.1445	18 25 50.8	4.932
16	15 27 24.41	2.1478	18 30 44.1	4.844
17	15 29 33.38	2.1511	18 35 32.1	4.756
18	15 31 42.54	2.1543	18 40 14.8	4.667
19	15 33 51.89	2.1575	18 44 52.1	4.577
20	15 36 1.44	2.1607	18 49 24.0	4.486
21	15 38 11.18	2.1639	18 53 50.4	4.394
22	15 40 21.11	2.1671	18 58 11.3	4.303
23	15 42 31.23	2.1703	19 2 26.8	4.211
24	15 44 41.55	2.1735	S. 19 6 36.7	4.118

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	15 44 41.55	2.1735	S. 19 6 36.7	4.118
1	15 46 52.05	2.1766	19 10 41.0	4.024
2	15 49 2.74	2.1797	19 14 39.6	3.930
3	15 51 13.61	2.1827	19 18 32.6	3.836
4	15 53 24.67	2.1858	19 22 19.9	3.740
5	15 55 35.91	2.1888	19 26 1.4	3.643
6	15 57 47.33	2.1918	19 29 37.1	3.547
7	15 59 58.93	2.1948	19 33 7.0	3.450
8	16 2 10.71	2.1978	19 36 31.1	3.352
9	16 4 22.67	2.2007	19 39 49.3	3.254
10	16 6 34.80	2.2036	19 43 1.6	3.155
11	16 8 47.10	2.2065	19 46 7.9	3.056
12	16 10 59.58	2.2094	19 49 8.3	2.957
13	16 13 12.23	2.2122	19 52 2.7	2.856
14	16 15 25.05	2.2150	19 54 51.0	2.755
15	16 17 38.03	2.2177	19 57 33.3	2.654
16	16 19 51.17	2.2204	20 0 9.5	2.552
17	16 22 4.48	2.2231	20 2 39.5	2.449
18	16 24 17.95	2.2258	20 5 3.4	2.347
19	16 26 31.58	2.2284	20 7 21.1	2.243
20	16 28 45.36	2.2310	20 9 32.6	2.139
21	16 30 59.30	2.2336	20 11 37.8	2.035
22	16 33 13.39	2.2361	20 13 36.8	1.931
23	16 35 27.63	2.2386	S. 20 15 29.5	1.825

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	16 37 42.02	2.2411	S. 20 17 15.8	1.719
1	16 39 56.56	2.2435	20 18 55.8	1.613
2	16 42 11.24	2.2458	20 20 29.4	1.507
3	16 44 26.06	2.2482	20 21 56.6	1.400
4	16 46 41.02	2.2505	20 23 17.4	1.292
5	16 48 56.12	2.2528	20 24 31.7	1.185
6	16 51 11.35	2.2550	20 25 39.6	1.077
7	16 53 26.72	2.2572	20 26 41.0	0.969
8	16 55 42.22	2.2593	20 27 35.9	0.860
9	16 57 57.84	2.2614	20 28 24.2	0.750
10	17 0 13.59	2.2635	20 29 5.9	0.641
11	17 2 29.46	2.2655	20 29 41.1	0.532
12	17 4 45.45	2.2675	20 30 9.7	0.422
13	17 7 1.56	2.2695	20 30 31.7	0.311
14	17 9 17.79	2.2714	20 30 47.0	0.200
15	17 11 34.13	2.2732	20 30 55.7	− 0.089
16	17 13 50.58	2.2750	20 30 57.7	+ 0.022
17	17 16 7.13	2.2768	20 30 53.1	0.133
18	17 18 23.79	2.2785	20 30 41.8	0.244
19	17 20 40.55	2.2801	20 30 23.8	0.356
20	17 22 57.41	2.2817	20 29 59.0	0.469
21	17 25 14.36	2.2833	20 29 27.5	0.582
22	17 27 31.41	2.2850	20 28 49.2	0.694
23	17 29 48.56	2.2866	20 28 4.2	0.807
24	17 32 5.80	2.2880	S. 20 27 12.4	0.920

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 17.					THURSDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 32 5.80	2.2880	S. 20 27 12.4	0.920	0	19 22 49.42	2.3115	S. 17 32 22.2	6.317
1	17 34 23.12	2.2893	20 26 13.8	1.033	1	19 25 8.10	2.3112	17 25 59.9	6.424
2	17 36 40.52	2.2907	20 25 8.4	1.147	2	19 27 26.76	2.3109	17 19 31.3	6.530
3	17 38 58.01	2.2921	20 23 56.2	1.260	3	19 29 45.41	2.3106	17 12 56.3	6.637
4	17 41 15.58	2.2934	20 22 37.2	1.373	4	19 32 4.04	2.3102	17 6 14.9	6.743
5	17 43 33.22	2.2947	20 21 11.4	1.487	5	19 34 22.64	2.3098	16 59 27.2	6.847
6	17 45 50.94	2.2959	20 19 38.8	1.601	6	19 36 41.22	2.3095	16 52 33.3	6.951
7	17 48 8.73	2.2971	20 17 59.3	1.715	7	19 38 59.78	2.3091	16 45 33.1	7.055
8	17 50 26.59	2.2982	20 16 13.0	1.828	8	19 41 18.31	2.3087	16 38 26.7	7.158
9	17 52 44.51	2.2993	20 14 19.9	1.942	9	19 43 36.82	2.3082	16 31 14.1	7.262
10	17 55 2.50	2.3003	20 12 19.9	2.057	10	19 45 55.30	2.3077	16 23 55.3	7.365
11	17 57 20.55	2.3013	20 10 13.1	2.171	11	19 48 13.75	2.3072	16 16 30.3	7.467
12	17 59 38.65	2.3022	20 7 59.4	2.285	12	19 50 32.17	2.3067	16 8 59.2	7.568
13	18 1 56.81	2.3031	20 5 38.9	2.399	13	19 52 50.56	2.3063	16 1 22.1	7.668
14	18 4 15.02	2.3040	20 3 11.5	2.514	14	19 55 8.93	2.3059	15 53 39.0	7.768
15	18 6 33.29	2.3049	20 0 37.2	2.628	15	19 57 27.27	2.3054	15 45 49.9	7.868
16	18 8 51.61	2.3057	19 57 56.1	2.742	16	19 59 45.58	2.3049	15 37 54.8	7.968
17	18 11 9.97	2.3063	19 55 8.1	2.857	17	20 2 3.86	2.3044	15 29 53.7	8.067
18	18 13 28.37	2.3070	19 52 13.3	2.971	18	20 4 22.11	2.3038	15 21 46.7	8.165
19	18 15 46.81	2.3077	19 49 11.6	3.085	19	20 6 40.32	2.3032	15 13 33.9	8.262
20	18 18 5.29	2.3083	19 46 3.1	3.199	20	20 8 58.50	2.3027	15 5 15.3	8.358
21	18 20 23.81	2.3089	19 42 47.7	3.313	21	20 11 16.65	2.3022	14 56 51.0	8.454
22	18 22 42.36	2.3094	19 39 25.5	3.427	22	20 13 34.77	2.3017	14 48 20.9	8.549
23	18 25 0.94	2.3099	S. 19 35 56.5	3.540	23	20 15 52.86	2.3012	S. 14 39 45.1	8.643
	WEDNESDAY 18.					FRIDAY 20.			
0	18 27 19.55	2.3104	S. 19 32 20.7	3.653	0	20 18 10.91	2.3006	S. 14 31 3.7	8.737
1	18 29 38.19	2.3108	19 28 38.1	3.767	1	20 20 28.93	2.3001	14 22 16.7	8.830
2	18 31 56.85	2.3112	19 24 48.6	3.881	2	20 22 46.92	2.2996	14 13 24.1	8.922
3	18 34 15.53	2.3115	19 20 52.3	3.995	3	20 25 4.88	2.2991	14 4 26.0	9.014
4	18 36 34.23	2.3118	19 16 49.2	4.108	4	20 27 22.81	2.2986	13 55 22.4	9.106
5	18 38 52.95	2.3121	19 12 39.3	4.221	5	20 29 40.71	2.2980	13 46 13.3	9.197
6	18 41 11.69	2.3124	19 8 22.7	4.333	6	20 31 58.57	2.2974	13 36 58.8	9.286
7	18 43 30.44	2.3126	19 3 59.3	4.446	7	20 34 16.40	2.2969	13 27 39.0	9.374
8	18 45 49.20	2.3127	18 59 29.2	4.558	8	20 36 34.20	2.2964	13 18 13.9	9.461
9	18 48 7.97	2.3129	18 54 52.3	4.671	9	20 38 51.97	2.2960	13 8 43.6	9.548
10	18 50 26.75	2.3130	18 50 8.7	4.783	10	20 41 9.72	2.2956	12 59 8.1	9.635
11	18 52 45.53	2.3131	18 45 18.4	4.894	11	20 43 27.44	2.2951	12 49 27.4	9.722
12	18 55 4.32	2.3132	18 40 21.4	5.005	12	20 45 45.13	2.2946	12 39 41.5	9.806
13	18 57 23.11	2.3132	18 35 17.8	5.116	13	20 48 2.79	2.2941	12 29 50.6	9.889
14	18 59 41.90	2.3131	18 30 7.5	5.227	14	20 50 20.42	2.2937	12 19 54.8	9.972
15	19 2 0.68	2.3130	18 24 50.5	5.338	15	20 52 38.03	2.2932	12 9 54.0	10.054
16	19 4 19.46	2.3130	18 19 26.9	5.448	16	20 54 55.61	2.2928	11 59 48.3	10.135
17	19 6 38.24	2.3130	18 13 56.7	5.558	17	20 57 13.17	2.2924	11 49 37.8	10.216
18	19 8 57.02	2.3129	18 8 19.9	5.667	18	20 59 30.70	2.2920	11 39 22.4	10.296
19	19 11 15.79	2.3127	18 2 36.6	5.777	19	21 1 48.21	2.2917	11 29 2.3	10.374
20	19 13 34.54	2.3124	17 56 46.7	5.886	20	21 4 5.70	2.2913	11 18 37.5	10.451
21	19 15 53.28	2.3122	17 50 50.3	5.994	21	21 6 23.17	2.2910	11 8 8.1	10.527
22	19 18 12.01	2.3120	17 44 47.4	6.102	22	21 8 40.62	2.2907	10 57 34.2	10.603
23	19 20 30.72	2.3117	17 38 38.0	6.210	23	21 10 58.05	2.2904	10 46 55.7	10.679
24	19 22 49.42	2.3115	S. 17 32 22.2	6.317	24	21 13 15.47	2.2901	S. 10 36 12.7	10.753

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 13 15.47	2.2901	S. 10 36 12.7	10.753
1	21 15 32.87	2.2898	10 25 25.3	10.826
2	21 17 50.25	2.2896	10 14 33.6	10.897
3	21 20 7.62	2.2894	10 3 37.6	10.968
4	21 22 24.98	2.2892	9 52 37.4	11.037
5	21 24 42.33	2.2890	9 41 33.1	11.106
6	21 26 59.66	2.2888	9 30 24.7	11.174
7	21 29 16.99	2.2887	9 19 12.2	11.242
8	21 31 34.31	2.2887	9 7 55.7	11.308
9	21 33 51.63	2.2887	8 56 35.3	11.372
10	21 36 8.95	2.2886	8 45 11.1	11.435
11	21 38 26.26	2.2885	8 33 43.1	11.498
12	21 40 43.57	2.2885	8 22 11.3	11.560
13	21 43 0.88	2.2886	8 10 35.9	11.619
14	21 45 18.20	2.2887	7 58 57.0	11.678
15	21 47 35.52	2.2888	7 47 14.5	11.737
16	21 49 52.85	2.2889	7 35 28.5	11.794
17	21 52 10.19	2.2891	7 23 39.2	11.849
18	21 54 27.54	2.2893	7 11 46.6	11.904
19	21 56 44.90	2.2895	6 59 50.7	11.957
20	21 59 2.28	2.2898	6 47 51.7	12.009
21	22 1 19.68	2.2901	6 35 49.6	12.061
22	22 3 37.09	2.2904	6 23 44.4	12.111
23	22 5 54.52	2.2908	S. 6 11 36.3	12.159

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 8 11.98	2.2912	S. 5 59 25.3	12.207
1	22 10 29.46	2.2916	5 47 11.5	12.253
2	22 12 46.97	2.2920	5 34 55.0	12.298
3	22 15 4.50	2.2925	5 22 35.8	12.342
4	22 17 22.07	2.2931	5 10 14.0	12.384
5	22 19 39.67	2.2936	4 57 49.7	12.425
6	22 21 57.30	2.2942	4 45 23.0	12.465
7	22 24 14.97	2.2948	4 32 53.9	12.504
8	22 26 32.68	2.2955	4 20 22.5	12.541
9	22 28 50.43	2.2962	4 7 49.0	12.576
10	22 31 8.22	2.2969	3 55 13.4	12.611
11	22 33 26.06	2.2977	3 42 35.7	12.645
12	22 35 43.95	2.2986	3 29 56.0	12.677
13	22 38 1.89	2.2994	3 17 14.5	12.707
14	22 40 19.88	2.3003	3 4 31.2	12.737
15	22 42 37.92	2.3012	2 51 46.1	12.765
16	22 44 56.02	2.3022	2 38 59.4	12.791
17	22 47 14.18	2.3032	2 26 11.2	12.815
18	22 49 32.41	2.3043	2 13 21.6	12.839
19	22 51 50.70	2.3053	2 0 30.5	12.862
20	22 54 9.05	2.3064	1 47 38.1	12.883
21	22 56 27.47	2.3076	1 34 44.5	12.902
22	22 58 45.96	2.3088	1 21 49.8	12.920
23	23 1 4.52	2.3100	1 8 54.1	12.937
24	23 3 23.16	2.3113	S. 0 55 57.4	12.952

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 3 23.16	2.3113	S. 0 55 57.4	12.952
1	23 5 41.88	2.3126	0 42 59.9	12.965
2	23 8 0.67	2.3139	0 30 1.6	12.977
3	23 10 19.54	2.3153	0 17 2.6	12.988
4	23 12 38.50	2.3167	S. 0 4 3.0	12.997
5	23 14 57.55	2.3181	N. 0 8 57.1	13.005
6	23 17 16.68	2.3196	0 21 57.6	13.012
7	23 19 35.90	2.3212	0 34 58.5	13.017
8	23 21 55.22	2.3227	0 47 59.6	13.019
9	23 24 14.63	2.3243	1 1 0.8	13.021
10	23 26 34.14	2.3260	1 14 2.1	13.021
11	23 28 53.75	2.3277	1 27 3.3	13.019
12	23 31 13.46	2.3293	1 40 4.4	13.017
13	23 33 33.27	2.3311	1 53 5.3	13.012
14	23 35 53.19	2.3328	2 6 5.9	13.006
15	23 38 13.21	2.3346	2 19 6.0	12.998
16	23 40 33.34	2.3364	2 32 5.6	12.989
17	23 42 53.58	2.3383	2 45 4.7	12.979
18	23 45 13.94	2.3402	2 58 3.1	12.967
19	23 47 34.41	2.3422	3 11 0.7	12.952
20	23 49 55.00	2.3442	3 23 57.4	12.936
21	23 52 15.71	2.3462	3 36 53.0	12.919
22	23 54 36.54	2.3482	3 49 47.6	12.901
23	23 56 57.49	2.3503	N. 4 2 41.1	12.881

TUESDAY 24

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	23 59 18.56	2.3523	N. 4 15 33.3	12.858
1	0 1 39.76	2.3544	4 28 24.1	12.835
2	0 4 1.09	2.3565	4 41 13.5	12.810
3	0 6 22.54	2.3587	4 54 1.3	12.783
4	0 8 44.13	2.3609	5 6 47.5	12.755
5	0 11 5.85	2.3631	5 19 31.9	12.725
6	0 13 27.70	2.3653	5 32 14.5	12.693
7	0 15 49.69	2.3676	5 44 55.1	12.660
8	0 18 11.81	2.3698	5 57 33.7	12.626
9	0 20 34.07	2.3722	6 10 10.2	12.590
10	0 22 56.47	2.3745	6 22 44.5	12.552
11	0 25 19.01	2.3768	6 35 16.4	12.512
12	0 27 41.68	2.3791	6 47 45.9	12.471
13	0 30 4.50	2.3815	7 0 12.9	12.428
14	0 32 27.46	2.3839	7 12 37.3	12.383
15	0 34 50.57	2.3863	7 24 58.9	12.337
16	0 37 13.82	2.3887	7 37 17.7	12.289
17	0 39 37.22	2.3912	7 49 33.6	12.240
18	0 42 0.77	2.3937	8 1 46.5	12.189
19	0 44 24.46	2.3961	8 13 56.3	12.137
20	0 46 48.30	2.3986	8 26 2.9	12.083
21	0 49 12.29	2.4011	8 38 6.2	12.027
22	0 51 36.43	2.4036	8 50 6.1	11.969
23	0 54 0.72	2.4061	9 2 2.5	11.911
24	0 56 25.16	2.4086	N. 9 13 55.4	11.851

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 56 25.16	2.4086	N. 9 13 55.4	11.851
1	0 58 49.75	2.4111	9 25 44.6	11.788
2	1 1 14.49	2.4136	9 37 30.0	11.725
3	1 3 39.38	2.4161	9 49 11.6	11.660
4	1 6 4.42	2.4186	10 0 49.2	11.592
5	1 8 29.61	2.4210	10 12 22.7	11.524
6	1 10 54.94	2.4234	10 23 52.1	11.455
7	1 13 20.42	2.4260	10 35 17.3	11.383
8	1 15 46.06	2.4286	10 46 38.1	11.310
9	1 18 11.85	2.4311	10 57 54.5	11.236
10	1 20 37.79	2.4335	11 9 6.4	11.160
11	1 23 3.87	2.4359	11 20 13.7	11.082
12	1 25 30.10	2.4384	11 31 16.3	11.003
13	1 27 56.48	2.4408	11 42 14.1	10.923
14	1 30 23.00	2.4433	11 53 7.1	10.842
15	1 32 49.67	2.4458	12 3 55.1	10.758
16	1 35 16.49	2.4482	12 14 38.1	10.674
17	1 37 43.45	2.4505	12 25 16.0	10.587
18	1 40 10.55	2.4528	12 35 48.6	10.499
19	1 42 37.79	2.4552	12 46 15.9	10.411
20	1 45 5.17	2.4575	12 56 37.9	10.321
21	1 47 32.69	2.4597	13 6 54.4	10.229
22	1 50 0.34	2.4620	13 17 5.3	10.136
23	1 52 28.13	2.4643	N.13 27 10.7	10.042

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	1 54 56.06	2.4666	N.13 37 10.4	9.947
1	1 57 24.12	2.4687	13 47 4.3	9.849
2	1 59 52.30	2.4708	13 56 52.3	9.750
3	2 2 20.61	2.4729	14 6 34.3	9.650
4	2 4 49.05	2.4750	14 16 10.3	9.550
5	2 7 17.61	2.4770	14 25 40.3	9.448
6	2 9 46.29	2.4790	14 35 4.1	9.344
7	2 12 15.09	2.4810	14 44 21.6	9.240
8	2 14 44.01	2.4829	14 53 32.9	9.135
9	2 17 13.04	2.4848	15 2 37.8	9.027
10	2 19 42.18	2.4866	15 11 36 2	8.919
11	2 22 11.43	2.4883	15 20 28.1	8.810
12	2 24 40.78	2.4900	15 29 13.4	8.699
13	2 27 10.23	2.4918	15 37 52.0	8.588
14	2 29 39.79	2.4935	15 46 23.9	8.476
15	2 32 9.45	2.4951	15 54 49.1	8.363
16	2 34 39.20	2.4965	16 3 7.5	8.249
17	2 37 9.03	2.4979	16 11 19.0	8.133
18	2 39 38.95	2.4994	16 19 23.5	8.017
19	2 42 8.96	2.5007	16 27 21.0	7.899
20	2 44 39.04	2.5020	16 35 11.4	7.780
21	2 47 9.20	2.5032	16 42 54.6	7.661
22	2 49 39.43	2.5044	16 50 30.7	7.542
23	2 52 9.73	2.5055	16 57 59.6	7.421
24	2 54 40.09	2.5065	N.17 5 21.2	7.298

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff for 1 m.
	h m s	s	° ′ ″	″
0	2 54 40.09	2.5065	N.17 5 21.2	7.298
1	2 57 10.51	2.5075	17 12 35.4	7.175
2	2 59 40.99	2.5084	17 19 42.2	7.052
3	3 2 11.52	2.5092	17 26 41.6	6.928
4	3 4 42.10	2.5100	17 33 33.5	6.803
5	3 7 12.72	2.5107	17 40 17.9	6.678
6	3 9 43.39	2.5114	17 46 54.8	6.552
7	3 12 14.09	2.5119	17 53 24.1	6.424
8	3 14 44.82	2.5123	17 59 45.7	6.296
9	3 17 15.57	2.5127	18 5 59.6	6.168
10	3 19 46.35	2.5131	18 12 5.9	6.040
11	3 22 17.14	2.5134	18 18 4.4	5.910
12	3 24 47.95	2.5136	18 23 55.1	5.780
13	3 27 18.77	2.5137	18 29 38.0	5.650
14	3 29 49.59	2.5136	18 35 13.1	5.519
15	3 32 20.40	2.5135	18 40 40.3	5.388
16	3 34 51.21	2.5133	18 45 59.6	5.256
17	3 37 22.00	2.5131	18 51 11.0	5.123
18	3 39 52.78	2.5127	18 56 14.4	4.991
19	3 42 23.53	2.5123	19 1 9.9	4.858
20	3 44 54.26	2.5119	19 5 57.4	4.725
21	3 47 24.96	2.5114	19 10 36.9	4.592
22	3 49 55.63	2.5107	19 15 8.4	4.457
23	3 52 26.25	2.5099	N.19 19 31.8	4.323

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff for 1 m.
0	3 54 56.82	2.5091	N.19 23 47.2	4.190
1	3 57 27.34	2.5082	19 27 54.6	4.056
2	3 59 57.81	2.5072	19 31 53.9	3.921
3	4 2 28.21	2.5061	19 35 45.1	3.786
4	4 4 58.54	2.5049	19 39 28.2	3.651
5	4 7 28.80	2.5037	19 43 3.2	3.517
6	4 9 58.99	2.5025	19 46 30.2	3.382
7	4 12 29.10	2.5011	19 49 49.1	3.247
8	4 14 59.12	2.4995	19 52 59.9	3.112
9	4 17 29.04	2.4978	19 56 2.5	2.977
10	4 19 58.86	2.4961	19 58 57.1	2.842
11	4 22 28.57	2.4944	20 1 43.6	2.707
12	4 24 58.18	2.4926	20 4 22.0	2.572
13	4 27 27.68	2.4907	20 6 52.3	2.438
14	4 29 57.06	2.4886	20 9 14.6	2.304
15	4 32 26.31	2.4864	20 11 28.8	2.170
16	4 34 55.43	2.4842	20 13 35.0	2.036
17	4 37 24.42	2.4820	20 15 33.2	1.902
18	4 39 53.27	2.4797	20 17 23.3	1.769
19	4 42 21.98	2.4772	20 19 5.4	1.636
20	4 44 50.54	2.4747	20 20 39.6	1.503
21	4 47 18.94	2.4720	20 22 5.8	1.370
22	4 49 47.18	2.4693	20 23 24.0	1.238
23	4 52 15.26	2.4666	20 24 34.3	1.106
24	4 54 43.17	2.4637	N.20 25 36.7	0.974

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	4 54 43.17	2.4637	N.20 25 36.7	0.974
1	4 57 10.91	2.4608	20 26 31.2	0.843
2	4 59 38.47	2.4578	20 27 17.8	0.712
3	5 2 5.85	2.4548	20 27 56.6	0.582
4	5 4 33.05	2.4517	20 28 27.6	0.452
5	5 7 0.05	2.4484	20 28 50.8	0.323
6	5 9 26.86	2.4451	20 29 6.3	0.194
7	5 11 53.47	2.4418	20 29 14.1	+ 0.066
8	5 14 19.87	2.4383	20 29 14.2	− 0.062
9	5 16 46.07	2.4348	20 29 6.6	0.190
10	5 19 12.05	2.4313	20 28 51.4	0.317
11	5 21 37.82	2.4277	20 28 28.6	0.443
12	5 24 3.37	2.4239	20 27 58.2	0.569
13	5 26 28.69	2.4201	20 27 20.3	0.693
14	5 28 53.78	2.4162	20 26 35.0	0.817
15	5 31 18.64	2.4124	20 25 42.2	0.941
16	5 33 43.27	2.4086	20 24 42.0	1.064
17	5 36 7.67	2.4046	20 23 34.5	1.187
18	5 38 31.82	2.4004	20 22 19.6	1.309
19	5 40 55.72	2.3963	20 20 57.4	1.430
20	5 43 19.37	2.3921	20 19 28.0	1.550
21	5 45 42.77	2.3878	20 17 51.4	1.670
22	5 48 5.91	2.3835	20 16 7.6	1.788
23	5 50 28.79	2.3792	N.20 14 16.8	1.905

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	5 52 51.42	2.3749	N.20 12 19.0	2.023
1	5 55 13.78	2.3704	20 10 14.1	2.140
2	5 57 35.87	2.3659	20 8 2.2	2.256
3	5 59 57.69	2.3614	20 5 43.4	2.371
4	6 2 19.24	2.3568	20 3 17.7	2.484
5	6 4 40.51	2.3522	20 0 45.3	2.597
6	6 7 1.51	2.3476	19 58 6.1	2.710
7	6 9 22.23	2.3429	19 55 20.1	2.822
8	6 11 42.66	2.3382	19 52 27.5	2.932
9	6 14 2.81	2.3334	19 49 28.3	3.042
10	6 16 22.67	2.3287	19 46 22.5	3.152
11	6 18 42.25	2.3239	19 43 10.1	3.260
12	6 21 1.54	2.3190	19 39 51.3	3.367
13	6 23 20.53	2.3141	19 36 26.1	3.473
14	6 25 39.23	2.3092	19 32 54.5	3.579
15	6 27 57.64	2.3043	19 29 16.6	3.683
16	6 30 15.75	2.2993	19 25 32.5	3.787
17	6 32 33.56	2.2944	19 21 42.2	3.890
18	6 34 51.08	2.2895	19 17 45.7	3.992
19	6 37 8.30	2.2844	19 13 43.1	4.093
20	6 39 25.21	2.2793	19 9 34.5	4.193
21	6 41 41.81	2.2742	19 5 19.9	4.292
22	6 43 58.11	2.2692	19 0 59.4	4.391
23	6 46 14.11	2.2642	18 56 33.0	4.489
24	6 48 29.81	2.2591	N.18 52 0.7	4.587

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	6 48 29.81	2.2591	N.18 52 0.7	4.587
1	6 50 45.20	2.2539	18 47 22.6	4.682
2	6 53 0.28	2.2488	18 42 38.9	4.775
3	6 55 15.06	2.2437	18 37 49.6	4.868
4	6 57 29.53	2.2386	18 32 54.7	4.961
5	6 59 43.69	2.2334	18 27 54.2	5.054
6	7 1 57.54	2.2283	18 22 48.2	5.145
7	7 4 11.08	2.2232	18 17 36.8	5.235
8	7 6 24.32	2.2181	18 12 20.0	5.324
9	7 8 37.25	2.2129	18 6 57.9	5.412
10	7 10 49.87	2.2077	18 1 30.5	5.500
11	7 13 2.18	2.2026	17 55 57.9	5.587
12	7 15 14.18	2.1975	17 50 20.1	5.673
13	7 17 25.88	2.1924	17 44 37.2	5.757
14	7 19 37.27	2.1873	17 38 49.3	5.839
15	7 21 48.35	2.1822	17 32 56.5	5.922
16	7 23 59.13	2.1771	17 26 58.7	6.004
17	7 26 9.60	2.1720	17 20 56.0	6.086
18	7 28 19.77	2.1669	17 14 48.4	6.166
19	7 30 29.63	2.1618	17 8 36.1	6.244
20	7 32 39.19	2.1568	17 2 19.1	6.322
21	7 34 48.45	2.1518	16 55 57.4	6.400
22	7 36 57.41	2.1468	16 49 31.1	6.477
23	7 39 6.07	2.1417	N.16 43 0.2	6.552

WEDNESDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	7 41 14.43	2.1368	N.16 36 24.9	6.626

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter	3	14	17.6
● New Moon	11	18	1.5
☽ First Quarter . . .	19	11	54.7
○ Full Moon	26	2	33.9

	d	h
☾ Apogee.	9	5.3
☾ Perigee.	24	16.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Pegasi	W.	76° 7′ 22″	2583	77° 46′ 40″	2601	79° 25′ 34″	2618	81° 4′ 4″	2636
	α Arietis	W.	32 29 41	2591	34 8 48	2597	35 47 47	2604	37 26 36	2612
	Pollux	E.	45 35 53	2597	43 56 54	2626	42 18 35	2658	40 40 59	2691
	Regulus	E.	81 35 5	2448	79 52 38	2467	78 10 38	2487	76 29 6	2506
	Sun	E.	121 33 32	2761	119 58 13	2782	118 23 21	2801	116 48 55	2822
2	α Arietis	W.	45 37 18	2671	47 14 37	2684	48 51 39	2698	50 28 22	2712
	Saturn	W.	24 26 17	2577	26 5 43	2594	27 44 46	2611	29 23 26	2627
	Pollux	E.	32 44 47	2889	31 12 14	2939	29 40 44	2993	28 10 22	3053
	Regulus	E.	68 8 6	2601	66 29 13	2621	64 50 46	2639	63 12 44	2658
	Sun	E.	109 3 16	2922	107 31 25	2941	105 59 58	2961	104 28 56	2980
3	α Arietis	W.	58 27 13	2783	60 2 3	2798	61 36 34	2811	63 10 47	2825
	Saturn	W.	37 31 12	2709	39 7 40	2725	40 43 46	2741	42 19 32	2756
	Aldebaran	W.	25 0 22	2772	26 35 26	2783	28 10 16	2795	29 44 51	2806
	Regulus	E.	55 8 49	2749	53 33 14	2766	51 58 2	2784	50 23 13	2801
	Sun	E.	96 59 38	3072	95 30 54	3090	94 2 32	3106	92 34 30	3124
4	α Arietis	W.	70 57 25	2892	72 29 54	2905	74 2 7	2917	75 34 4	2929
	Saturn	W.	50 13 31	2827	51 47 24	2840	53 21 0	2853	54 54 19	2866
	Aldebaran	W.	37 33 58	2866	39 7 1	2877	40 39 49	2889	42 12 22	2900
	Regulus	E.	42 34 42	2885	41 2 4	2902	39 29 48	2919	37 57 53	2935
	Sun	E.	85 19 20	3203	83 53 14	3218	82 27 26	3231	81 1 54	3246
5	Saturn	W.	62 37 5	2922	64 8 56	2932	65 40 34	2942	67 11 59	2951
	Aldebaran	W.	49 51 38	2953	51 22 50	2962	52 53 50	2972	54 24 38	2981
	Jupiter	W.	27 26 46	2977	28 57 28	2984	30 28 1	2992	31 58 24	3000
	Regulus	E.	30 23 35	3022	28 53 49	3041	27 24 27	3060	25 55 29	3082
	Sun	E.	73 58 10	3308	72 34 8	3319	71 10 19	3331	69 46 43	3341
6	Saturn	W.	74 46 21	2992	76 16 44	2999	77 46 58	3005	79 17 4	3012
	Aldebaran	W.	61 56 0	3020	63 25 48	3026	64 55 28	3033	66 25 0	3039
	Jupiter	W.	39 27 58	3035	40 57 27	3041	42 26 49	3047	43 56 3	3053
	Pollux	W.	22 7 46	3633	23 25 45	3568	24 44 54	3515	26 5 2	3471
	Sun	E.	62 51 32	3366	61 29 0	3394	60 6 37	3402	58 44 23	3409
7	Aldebaran	W.	73 50 57	3064	75 19 51	3068	76 48 40	3071	78 17 25	3074
	Jupiter	W.	51 20 38	3076	52 49 17	3080	54 17 51	3082	55 46 22	3086
	Pollux	W.	32 55 39	3336	34 19 9	3319	35 42 58	3305	37 7 4	3292
	Sun	E.	51 55 3	3438	50 33 30	3443	49 12 2	3447	47 50 39	3452
8	Aldebaran	W.	85 40 18	3086	87 8 45	3087	88 37 10	3088	90 5 34	3089
	Jupiter	W.	63 8 9	3095	64 36 25	3096	66 4 39	3098	67 32 51	3099
	Pollux	W.	44 10 48	3246	45 36 3	3239	47 1 26	3232	48 26 57	3226
	Sun	E.	41 4 46	3467	30 43 45	3470	38 22 47	3471	37 1 51	3472
9	Aldebaran	W.	97 27 26	3089	98 55 49	3088	100 24 13	3087	101 52 38	3087
	Jupiter	W.	74 53 49	3097	76 22 2	3096	77 50 17	3095	79 18 33	3093
	Pollux	W.	55 36 13	3200	57 2 22	3195	58 28 37	3191	59 54 57	3186
	Sun	E.	30 17 34	3480	28 56 47	3480	27 36 1	3481	26 15 16	3481
13	Sun	W.	13 51 2	3414	15 13 3	3393	16 35 27	3377	17 58 10	3362
	Antares	E.	34 23 4	3045	32 53 47	3046	31 24 31	3047	29 55 17	3050

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Pegasi	W.	82° 42′ 10″	2654	84° 19′ 52″	2672	85° 57′ 10″	2689	87° 34′ 4″	2708
	α Arietis	W.	39 5 14	2622	40 43 39	2633	42 21 49	2646	43 59 42	2658
	Pollux	E.	39 4 7	2725	37 28 1	2763	35 52 44	2801	34 18 18	2844
	Regulus	E.	74 48 1	2525	73 7 23	2544	71 27 11	2563	69 47 25	2583
	SUN	E.	115 14 56	2842	113 41 23	2862	112 8 15	2882	110 35 33	2901
2	α Arietis	W.	52 4 46	2726	53 40 51	2741	55 16 37	2755	56 52 4	2769
	SATURN	W.	31 1 44	2644	32 39 39	2660	34 17 12	2677	35 54 23	2693
	Pollux	E.	26 41 15	3122	25 13 32	3200	23 47 23	3291	22 23 1	3398
	Regulus	E.	61 35 8	2677	59 57 57	2695	58 21 10	2713	56 44 48	2731
	SUN	E.	102 58 18	2998	101 28 3	3018	99 58 12	3036	98 28 44	3054
3	α Arietis	W.	64 44 42	2839	66 18 19	2853	67 51 38	2866	69 24 40	2880
	SATURN	W.	43 54 58	2771	45 30 4	2785	47 4 51	2799	48 39 20	2813
	Aldebaran	W.	31 19 11	2818	32 53 16	2829	34 27 6	2842	36 0 40	3854
	Regulus	E.	48 48 47	2818	47 14 43	2835	45 41 1	2852	44 7 41	2869
	SUN	E.	91 6 49	3140	89 39 28	3156	88 12 26	3173	86 45 44	3188
4	α Arietis	W.	77 5 46	2941	78 37 13	2953	80 8 25	2963	81 39 24	2974
	SATURN	W.	56 27 22	2877	58 0 10	2889	59 32 43	2901	61 5 1	2912
	Aldebaran	W.	43 44 41	2911	45 16 46	2922	46 48 37	2933	48 20 14	2943
	Regulus	E.	36 26 19	2952	34 55 6	2969	33 24 14	2986	31 53 44	3003
	SUN	E.	79 36 39	3259	78 11 40	3272	76 46 56	3284	75 22 26	3296
5	SATURN	W.	68 43 13	2961	70 14 15	2969	71 45 7	2977	73 15 49	2985
	Aldebaran	W.	55 55 15	2989	57 25 41	2997	58 55 57	3005	60 26 3	3013
	JUPITER	W.	33 28 37	3007	34 58 41	3015	36 28 35	3022	37 58 21	3029
	Regulus	E.	24 26 58	3106	22 58 56	3132	21 31 25	3163	20 4 31	3197
	SUN	E.	68 23 19	3351	67 0 6	3360	65 37 4	3370	64 14 13	3379
6	SATURN	W.	80 47 2	3018	82 16 53	3023	83 46 37	3028	85 16 15	3033
	Aldebaran	W.	67 54 25	3045	69 23 42	3050	70 52 53	3055	72 21 58	3060
	JUPITER	W.	45 25 10	3059	46 54 10	3063	48 23 5	3068	49 51 54	3072
	Pollux	W.	27 25 59	3434	28 47 37	3404	30 9 49	3378	31 32 31	3355
	SUN	E.	57 22 17	3416	56 0 19	3422	54 38 27	3428	53 16 42	3433
7	Aldebaran	W.	79 46 6	3077	81 14 44	3080	82 43 18	3082	84 11 49	3084
	JUPITER	W.	57 14 49	3088	58 43 13	3091	60 11 34	3093	61 39 52	3094
	Pollux	W.	38 31 25	3281	39 55 59	3270	41 20 45	3261	42 45 42	3253
	SUN	E.	46 29 21	3455	45 8 7	3459	43 46 57	3462	42 25 50	3464
8	Aldebaran	W.	91 33 57	3090	93 2 19	3090	94 30 41	3090	95 59 3	3089
	JUPITER	W	69 1 2	3099	70 29 13	3098	71 57 25	3098	73 25 37	3098
	Pollux	W.	49 52 35	3220	51 18 20	3214	52 44 12	3209	54 10 10	3205
	SUN	E.	35 40 56	3474	34 20 3	3476	32 59 12	3477	31 38 22	3479
9	Aldebaran	W.	103 21 4	3085	104 49 32	3083	106 18 2	3082	107 46 34	3080
	JUPITER	W.	80 46 51	3091	82 15 11	3090	83 43 33	3087	85 11 58	3085
	Pollux	W.	61 21 23	3182	62 47 54	3177	64 14 31	3173	65 41 13	3168
	SUN	E.	24 54 31	3482	23 33 47	3485	22 13 6	3488	20 52 28	3490
13	SUN	W.	19 21 10	3349	20 44 25	3337	22 7 54	3325	23 31 36	3314
	Antares	E.	28 26 6	3055	26 57 1	3062	25 28 5	3071	23 59 20	3082

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	α Aquilæ	E.	87° 31′ 25″	3372	86° 8′ 36″	3366	84° 45′ 41″	3363	83° 22′ 42″	3359
14	Sun	W.	24 55 31	3304	26 19 38	3294	27 43 56	3284	29 8 26	3274
	α Aquilæ	E.	76 26 54	3348	75 3 38	3347	73 40 21	3347	72 17 4	3347
	Fomalhaut	E.	104 58 12	3419	103 36 17	3406	102 14 7	3393	100 51 42	3380
15	Sun	W.	36 13 47	3226	37 39 25	3217	39 5 14	3207	40 31 15	3197
	α Aquilæ	E.	65 21 3	3361	63 58 2	3367	62 35 8	3374	61 12 22	3382
	Fomalhaut	E.	93 56 20	3327	92 32 40	3318	91 8 49	3309	89 44 48	3301
16	Sun	W.	47 44 21	3145	49 11 36	3134	50 39 4	3124	52 6 44	3114
	α Aquilæ	E.	54 21 18	3445	52 59 52	3463	51 38 47	3485	50 18 6	3509
	Fomalhaut	E.	82 42 29	3266	81 17 38	3261	79 52 41	3256	78 27 38	3252
17	Sun	W.	59 28 32	3055	60 57 37	3043	62 26 57	3030	63 56 32	3018
	α Aquilæ	E.	43 42 41	3690	42 25 43	3743	41 9 41	3802	39 54 41	3869
	Fomalhaut	E.	71 21 25	3241	69 56 4	3242	68 30 44	3242	67 5 25	3244
	α Pegasi	E.	87 33 7	2851	85 59 45	2840	84 26 9	2830	82 52 20	2819
18	Sun	W.	71 28 26	2952	72 59 39	2939	74 31 9	2925	76 2 56	2911
	Antares	W.	29 29 44	2707	31 6 15	2685	32 43 15	2665	34 20 42	2645
	Venus	W.	28 22 41	2977	29 53 23	2954	31 24 34	2931	32 56 14	2909
	Fomalhaut	E.	60 0 0	3276	58 35 21	3288	57 10 56	3302	55 46 47	3319
	α Pegasi	E.	74 59 53	2769	73 24 44	2760	71 49 23	2750	70 13 49	2740
19	Sun	W.	83 46 23	2839	85 20 0	2824	86 53 57	2809	88 28 13	2795
	Antares	W.	42 34 17	2556	44 14 12	2539	45 54 31	2523	47 35 12	2507
	Venus	W.	40 41 6	2811	42 15 19	2793	43 49 56	2775	45 24 57	2756
	Fomalhaut	E.	48 51 49	3447	47 30 26	3487	46 9 47	3532	44 49 58	3583
	α Pegasi	E.	62 13 0	2698	60 36 18	2691	58 59 26	2684	57 22 25	2679
20	Sun	W.	96 24 29	2718	98 0 44	2703	99 37 21	2688	101 14 17	2673
	Antares	W.	56 4 16	2427	57 47 12	2412	59 30 29	2397	61 14 8	2382
	Venus	W.	53 25 53	2669	55 3 14	2653	56 40 57	2636	58 19 3	2619
	α Pegasi	E.	49 15 51	2665	47 38 24	2666	46 0 59	2669	44 23 38	2675
	α Arietis	E.	91 40 39	2441	89 58 3	2427	88 15 7	2413	86 31 51	2399
21	Sun	W.	109 24 3	2598	111 3 1	2583	112 42 19	2569	114 21 57	2555
	Antares	W.	69 57 49	2308	71 43 37	2294	73 29 46	2280	75 16 15	2266
	Venus	W.	66 35 11	2538	68 15 31	2523	69 56 12	2508	71 37 14	2492
	α Arietis	E.	77 50 35	2332	76 5 22	2319	74 19 50	2307	72 34 0	2295
	Saturn	E.	97 16 53	2263	95 29 59	2249	93 42 44	2235	91 55 9	2223
22	Sun	W.	122 44 54	2487	124 26 25	2475	126 8 13	2463	127 50 18	2451
	Antares	W.	84 13 35	2202	86 2 0	2190	87 50 42	2179	89 39 41	2168
	Venus	W.	80 7 35	2422	81 50 38	2410	83 33 59	2396	85 17 39	2384
	α Aquilæ	W.	38 31 45	3384	39 54 20	3283	41 18 51	3193	42 45 9	3112
	α Arietis	E.	63 40 34	2239	61 53 5	2230	60 5 22	2221	58 17 26	2213
	Saturn	E.	82 52 26	2160	81 2 58	2148	79 13 12	2137	77 23 9	2126
	Aldebaran	E.	96 42 11	2188	94 53 25	2176	93 4 21	2164	91 14 59	2153
23	Antares	W.	98 48 33	2120	100 39 1	2112	102 29 42	2105	104 20 34	2098
	Venus	W.	94 0 5	2331	95 45 19	2322	97 30 46	2314	99 16 25	2306

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
13	α Aquilæ	E.	81° 59′ 39″	3356	80° 36′ 32″	3353	79° 13′ 22″	3351	77° 50′ 9″	3349
14	Sun	W.	30 33 8	3265	31 58 1	3255	33 23 5	3246	34 48 20	3236
	α Aquilæ	E.	70 53 47	3349	69 30 32	3351	68 7 19	3353	66 44 9	3357
	Fomalhaut	E.	99 29 3	3369	98 6 11	3358	96 43 6	3347	95 19 49	3337
15	Sun	W.	41 57 28	3187	43 23 53	3177	44 50 30	3167	46 17 19	3156
	α Aquilæ	E.	59 49 45	3391	58 27 18	3401	57 5 3	3414	55 43 2	3429
	Fomalhaut	E.	88 20 38	3294	86 56 19	3286	85 31 51	3278	84 7 14	3271
16	Sun	W.	53 34 37	3102	55 2 44	3090	56 31 6	3078	57 59 42	3067
	α Aquilæ	E.	48 57 52	3536	47 38 8	3568	46 18 59	3603	45 0 28	3644
	Fomalhaut	E.	77 2 30	3248	75 37 18	3246	74 12 3	3243	72 46 45	3242
17	Sun	W.	65 26 23	3005	66 56 29	2993	68 26 51	2979	69 57 30	2965
	α Aquilæ	E.	38 40 50	3947	37 28 18	4037	36 17 15	4140	35 7 52	4258
	Fomalhaut	E.	65 40 8	3248	64 14 56	3253	62 49 49	3259	61 24 50	3267
	α Pegasi	E.	81 18 17	2809	79 44 1	2798	78 9 31	2788	76 34 48	2779
18	Sun	W.	77 35 1	2897	79 7 24	2883	80 40 5	2868	82 13 5	2854
	Antares	W.	35 58 36	2626	37 36 55	2609	39 15 38	2591	40 54 46	2574
	Venus	W.	34 28 21	2889	36 0 54	2869	37 33 53	2849	39 7 17	2830
	Fomalhaut	E.	54 22 57	3338	52 59 29	3358	51 36 25	3384	50 13 50	3414
	α Pegasi	E.	68 38 2	2731	67 2 3	2722	65 25 53	2714	63 49 32	2706
19	Sun	W.	90 2 48	2779	91 37 43	2764	93 12 58	2749	94 48 33	2733
	Antares	W.	49 16 16	2491	50 57 42	2475	52 39 31	2459	54 21 42	2443
	Venus	W.	47 0 22	2739	48 36 10	2722	50 12 21	2704	51 48 55	2687
	Fomalhaut	E.	43 31 5	3643	42 13 17	3712	40 56 43	3791	39 41 31	3881
	α Pegasi	E.	55 45 17	2674	54 8 2	2670	52 30 42	2667	50 53 18	2665
20	Sun	W.	102 51 33	2657	104 29 10	2643	106 7 7	2627	107 45 25	2612
	Antares	W.	62 58 9	2366	64 42 32	2352	66 27 16	2337	68 12 22	2322
	Venus	W.	59 57 32	2603	61 36 23	2586	63 15 37	2570	64 55 13	2554
	α Pegasi	E.	42 46 24	2684	41 9 22	2695	39 32 35	2709	37 56 7	2728
	α Arietis	E.	84 48 15	2385	83 4 19	2372	81 20 4	2358	79 35 29	2345
21	Sun	W.	116 1 54	2540	117 42 11	2527	119 22 47	2514	121 3 41	2500
	Antares	W.	77 3 4	2253	78 50 13	2240	80 37 41	2227	82 25 29	2214
	Venus	W.	73 18 38	2478	75 0 22	2463	76 42 27	2450	78 24 51	2436
	α Arietis	E.	70 47 53	2283	69 1 28	2271	67 14 46	2260	65 27 48	2249
	Saturn	E.	90 7 15	2209	88 19 1	2196	86 30 28	2184	84 41 36	2172
22	Sun	W.	129 32 40	2440	131 15 18	2429	132 58 11	2419	134 41 19	2410
	Antares	W.	91 28 57	2157	93 18 29	2147	95 8 16	2137	96 58 18	2129
	Venus	W.	87 1 36	2373	88 45 50	2362	90 30 20	2351	92 15 5	2341
	α Aquilæ	W.	44 13 4	3039	45 42 28	2973	47 13 14	2914	48 45 15	2861
	α Arietis	E.	56 29 18	2205	54 40 58	2198	52 52 28	2192	51 3 49	2187
	Saturn	E.	75 32 49	2115	73 42 13	2105	71 51 22	2096	70 0 16	2086
	Aldebaran	E.	89 25 20	2143	87 35 26	2133	85 45 17	2123	83 54 53	2113
23	Antares	W.	106 11 37	2092	108 2 49	2086	109 54 10	2081	111 45 38	2077
	Venus	W.	101 2 16	2299	102 48 17	2292	104 34 28	2287	106 20 47	2282

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	α Aquilæ	W.	50 18 24	2812	51 52 36	2768	53 27 46	2729	55 3 48	2692
	α Arietis	E.	49 15 2	2183	47 26 9	2180	45 37 12	2179	43 48 13	2178
	SATURN	E.	68 8 55	2077	66 17 21	2070	64 25 35	2062	62 33 37	2054
	Aldebaran	E.	82 4 14	2105	80 13 22	2097	78 22 18	2089	76 31 2	2081
	JUPITER	E.	104 46 20	2098	102 55 17	2088	101 4 0	2081	99 12 31	2073
24	α Aquilæ	W.	63 14 45	2557	64 54 39	2538	66 35 0	2520	68 15 45	2506
	Fomalhaut	W.	38 9 15	3543	39 28 52	3493	40 50 43	3317	42 14 35	3225
	SATURN	E.	53 11 16	2028	51 18 25	2025	49 25 29	2021	47 32 28	2019
	Aldebaran	E.	67 12 14	2055	65 20 6	2052	63 27 53	2050	61 35 36	2047
	JUPITER	E.	89 52 30	2044	88 0 5	2041	86 7 35	2038	84 15 0	2035
25	Fomalhaut	W.	49 37 35	2903	51 9 50	2860	52 43 0	2821	54 17 0	2788
	α Pegasi	W.	29 12 11	2700	30 48 51	2632	32 27 3	2575	34 6 32	2529
	SATURN	E.	38 6 59	2020	36 13 56	2023	34 20 57	2026	32 28 3	2030
	Aldebaran	E.	52 13 47	2050	50 21 30	2052	48 29 17	2055	46 37 9	2060
	JUPITER	E.	74 51 28	2033	72 58 46	2035	71 6 7	2038	69 13 32	2041
	Pollux	E.	94 39 56	2118	92 49 24	2119	90 58 54	2122	89 8 28	2135
26	Fomalhaut	W.	62 16 3	2681	63 53 8	2670	65 30 28	2660	67 8 1	2654
	α Pegasi	W.	42 36 52	2394	44 20 36	2380	46 4 40	2369	47 48 59	2362
	Aldebaran	E.	37 18 38	2096	35 27 32	2105	33 36 41	2116	31 46 7	2129
	JUPITER	E.	59 52 16	2068	58 0 28	2076	56 8 52	2085	54 17 29	2093
	Pollux	E.	79 58 1	2155	78 8 25	2164	76 19 3	2173	74 29 55	2183
27	Fomalhaut	W.	75 17 7	2651	76 54 53	2655	78 32 33	2662	80 10 4	2670
	α Pegasi	W.	56 32 13	2356	58 16 51	2360	60 1 23	2366	61 45 47	2373
	JUPITER	E.	45 4 20	2149	43 14 35	2162	41 25 10	2176	39 36 6	2190
	Pollux	E.	65 28 33	2248	63 41 17	2264	61 54 25	2281	60 7 58	2286
	Regulus	E.	101 56 32	2167	100 7 14	2178	98 18 14	2191	96 29 33	2204
28	α Pegasi	W.	70 24 47	2423	72 7 49	2436	73 50 33	2449	75 32 58	2463
	α Arietis	W.	26 50 48	2495	28 32 8	2485	30 13 42	2480	31 55 24	2479
	JUPITER	E.	30 36 27	2272	28 49 47	2291	27 3 34	2311	25 17 50	2332
	Pollux	E.	51 22 33	2401	49 39 0	2425	47 56 1	2450	46 13 38	2477
	Regulus	E.	87 31 21	2279	85 44 50	2295	83 58 43	2311	82 13 0	2328
29	α Arietis	W.	40 23 3	2509	42 4 4	2520	43 44 50	2531	45 25 20	2544
	SATURN	W.	20 41 43	2392	22 25 29	2407	24 8 54	2423	25 51 56	2439
	Pollux	E.	37 51 44	2626	36 13 38	2675	34 36 25	2718	33 0 9	2763
	Regulus	E.	73 30 42	2417	71 47 32	2436	70 4 49	2455	68 22 33	2474
30	α Arietis	W.	53 43 10	2615	55 21 44	2632	56 59 56	2647	58 37 47	2663
	SATURN	W.	34 21 10	2525	36 1 48	2543	37 42 1	2561	39 21 50	2579
	Aldebaran	W.	20 13 33	2620	21 52 1	2627	23 30 19	2638	25 8 23	2649
	Regulus	E.	59 57 53	2571	58 18 18	2590	56 39 9	2610	55 0 27	2629
	SUN	E.	128 35 20	2880	127 2 35	2900	125 39 16	2920	123 58 22	2939
31	α Arietis	W.	66 41 40	2744	68 17 22	2760	69 52 43	2775	71 27 43	2792
	SATURN	W.	47 34 52	2666	49 12 18	2683	50 49 21	2699	52 26 2	2716
	Aldebaran	W.	33 14 29	2718	34 50 45	2732	36 26 42	2747	38 2 19	2763
	Regulus	E.	46 53 37	2728	45 17 34	2747	43 41 57	2767	42 6 46	2787
	SUN	E.	116 25 2	3037	114 55 35	3055	113 26 30	3073	111 57 47	3091

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
23	α Aquilæ	W.	56° 40′ 39″	2659	58° 18′ 14″	2629	59° 56′ 29″	2602	61° 35′ 21″	2579
	α Arietis	E.	41 59 13	2180	40 10 15	2183	38 21 22	2188	36 32 37	2196
	Saturn	E.	60 41 27	2048	58 49 7	2042	56 56 38	2037	55 4 1	2032
	Aldebaran	E.	74 39 34	2075	72 47 56	2070	70 56 10	2064	69 4 16	2059
	Jupiter	E.	97 20 50	2066	95 28 59	2060	93 36 58	2054	91 44 48	2049
24	α Aquilæ	W.	69 56 50	2493	71 38 13	2482	73 19 52	2473	75 1 43	2465
	Fomalhaut	W.	43 40 15	3143	45 7 33	3071	46 36 18	3007	48 6 22	2952
	Saturn	E.	45 39 24	2018	43 46 18	2017	41 53 11	2017	40 0 4	2019
	Aldebaran	E.	59 43 15	2046	57 50 52	2046	55 58 29	2046	54 6 7	2048
	Jupiter	E.	82 22 21	2033	80 29 39	2033	78 36 56	2032	76 44 12	2032
25	Fomalhaut	W.	55 51 43	2760	57 27 4	2735	59 2 57	2714	60 39 18	2696
	α Pegasi	W.	35 47 5	2490	37 28 32	2458	39 10 44	2432	40 53 33	2411
	Saturn	E.	30 35 16	2035	28 42 37	2041	26 50 7	2048	24 57 48	2057
	Aldebaran	E.	44 45 8	2065	42 53 15	2071	41 1 31	2078	39 9 58	2086
	Jupiter	E.	67 21 2	2045	65 28 38	2050	63 36 22	2055	61 44 14	2062
	Pollux	E.	87 18 7	2130	85 27 53	2134	83 37 46	2140	81 47 48	2147
26	Fomalhaut	W.	68 45 43	2649	70 23 31	2646	72 1 23	2646	73 39 16	2647
	α Pegasi	W.	49 33 29	2357	51 18 6	2353	53 2 48	2353	54 47 31	2353
	Aldebaran	E.	29 55 52	2143	28 5 58	2159	26 16 28	2176	24 27 24	2195
	Jupiter	E.	52 26 19	2103	50 35 24	2114	48 44 46	2124	46 54 24	2136
	Pollux	E.	72 41 2	2194	70 52 26	2207	69 4 9	2220	67 16 11	2233
27	Fomalhaut	W.	81 47 24	2680	83 24 31	2690	85 1 24	2702	86 38 1	2716
	α Pegasi	W.	63 30 1	2380	65 14 4	2390	66 57 53	2400	68 41 28	2411
	Jupiter	E.	37 47 23	2205	35 59 3	2220	34 11 6	2237	32 23 34	2254
	Pollux	E.	58 21 56	2317	56 36 21	2336	54 51 14	2357	53 6 38	2379
	Regulus	E.	94 41 12	2218	92 53 11	2233	91 5 32	2247	89 18 15	2263
28	α Pegasi	W.	77 15 3	2478	78 56 47	2494	80 38 9	2510	82 19 9	2527
	α Arietis	W.	33 37 7	2480	35 18 48	2485	37 0 23	2491	38 41 49	2499
	Jupiter	E.	23 32 37	2354	21 47 56	2378	20 3 49	2404	18 20 20	2433
	Pollux	E.	44 31 52	2504	42 50 45	2535	41 10 20	2566	39 30 39	2600
	Regulus	E.	80 27 42	2346	78 42 49	2363	76 58 21	2380	75 14 18	2399
29	α Arietis	W.	47 5 32	2557	48 45 26	2571	50 25 1	2585	52 4 16	2601
	Saturn	W.	27 34 35	2456	29 16 50	2473	30 58 41	2490	32 40 8	2508
	Pollux	E.	31 24 53	2814	29 50 43	2870	28 17 46	2934	26 46 10	3005
	Regulus	E.	66 40 43	2493	64 59 20	2512	63 18 24	2532	61 37 55	2551
30	α Arietis	W.	60 15 17	2679	61 52 25	2695	63 29 12	2711	65 5 37	2728
	Saturn	W.	41 1 14	2596	42 40 14	2614	44 18 50	2631	45 57 3	2640
	Aldebaran	W.	26 46 12	2661	28 23 44	2675	30 0 58	2689	31 37 53	2703
	Regulus	E.	53 22 12	2649	51 44 24	2669	50 7 2	2688	48 30 6	2708
	Sun	E.	122 26 53	2958	120 55 48	2978	119 25 8	2998	117 54 53	3018
31	α Arietis	W.	73 2 22	2807	74 36 41	2822	76 10 40	2838	77 44 19	2852
	Saturn	W.	54 2 21	2732	55 38 18	2748	57 13 54	2764	58 49 9	2779
	Aldebaran	W.	39 37 36	2777	41 12 34	2792	42 47 12	2807	44 21 31	2821
	Regulus	E.	40 32 1	2807	38 57 42	2827	37 23 49	2847	35 50 22	2867
	Sun	E.	110 29 26	3109	109 1 27	3127	107 33 50	3144	106 6 34	3161

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	14 26 19.78	9.801	S. 14 29 48.8	-48.00	16 9.85	66.96	16 18.58	0.055
Thur.	2	14 30 15.43	9.837	14 48 54.0	47.42	16 10.09	67.08	16 19.48	0.020
Frid.	3	14 34 11.92	9.872	15 7 44.9	46.82	16 10.33	67.19	16 19.55	0.015
Sat.	4	14 38 9.23	9.907	15 26 20.9	-46.19	16 10.57	67.31	16 18.79	0.050
Sun.	5	14 42 7.38	9.942	15 44 41.8	45.54	16 10.81	67.42	16 17.19	0.085
Mon.	6	14 46 6.39	9.977	16 2 46.9	44.89	16 11.04	67.54	16 14.74	0.120
Tues.	7	14 50 6.26	10.012	16 20 36.1	-44.21	16 11.27	67.66	16 11.43	0.155
Wed.	8	14 54 6.98	10.048	16 38 8.9	43.51	16 11.50	67.78	16 7.27	0.191
Thur.	9	14 58 8.56	10.083	16 55 24.8	42.80	16 11.73	67.90	16 2.26	0.226
Frid.	10	15 2 11.00	10.119	17 12 23.3	-42.07	16 11.95	68.02	15 56.40	0.262
Sat.	11	15 6 14.29	10.155	17 29 4.3	41.32	16 12.18	68.14	15 49.68	0.298
Sun.	12	15 10 18.43	10.191	17 45 27.1	40.57	16 12.40	68.26	15 42.12	0.333
Mon.	13	15 14 23.42	10.226	18 1 31.4	-39.78	16 12.62	68.38	15 33.71	0.368
Tues.	14	15 18 29.24	10.260	18 17 16.7	38.98	16 12.84	68.50	15 24.47	0.402
Wed.	15	15 22 35.90	10.295	18 32 42.8	38.16	16 13.06	68.62	15 14.40	0.437
Thur.	16	15 26 43.38	10 329	18 47 49.0	-37.34	16 13.27	68.74	15 3.50	0.471
Frid.	17	15 30 51.68	10.363	19 2 35.1	36.49	16 13.48	68.86	14 51.78	0.505
Sat.	18	15 35 0.80	10.397	19 17 0.9	35.64	16 13.68	68.97	14 39.25	0.539
Sun.	19	15 39 10.74	10.430	19 31 5.9	-34.76	16 13.89	69 09	14 25.91	0.572
Mon.	20	15 43 21.48	10.463	19 44 49.6	33.86	16 14.09	69.21	14 11.77	0.605
Tues.	21	15 47 33.00	10.496	19 58 11.6	32.96	16 14.29	69.32	13 56.84	0.638
Wed.	22	15 51 45.31	10.528	20 11 11.8	-32.03	16 14.48	69.43	13 41.13	0.670
Thur.	23	15 55 58.40	10.560	20 23 49.8	31.08	16 14.67	69.54	13 24.63	0.702
Frid.	24	16 0 12.27	10.592	20 36 5.0	30.14	16 14.85	69.64	13 7.36	0.734
Sat.	25	16 4 26.90	10.625	20 47 57.3	-29.17	16 15.03	69.74	12 49.34	0.766
Sun.	26	16 8 42.28	10.657	20 59 26.2	28.20	16 15 20	69.84	12 30.57	0.798
Mon.	27	16 12 58.40	10.687	21 10 31.5	27.21	16 15.37	69.94	12 11.06	0.828
Tues.	28	16 17 15.24	10.717	21 21 12.9	-26.21	16 15.53	70.04	11 50.83	0.858
Wed.	29	16 21 32.80	10.746	21 31 30.0	25.20	16 15.68	70.14	11 29.89	0.887
Thur.	30	16 25 51.05	10.774	21 41 22.7	24.17	16 15.83	70.23	11 8.25	0.915
Frid.	31	16 30 9.98	10.802	S. 21 50 50.5	-23.13	16 15.98	70.32	10 45.94	0.943

Note.—The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	14 26 22.44	9.802	S. 14 30 1.9	−48.00	16 18.59	0.055	14 42 41.03
Thur.	2	14 30 18.10	9.837	14 49 6.9	47.41	16 19.48	0.020	14 46 37.58
Frid.	3	14 34 14.60	9.872	15 7 57.7	46.80	16 19.54	0.015	14 50 34.14
Sat.	4	14 38 11.92	9.907	15 26 33.5	−46.18	16 18.77	0.050	14 54 30.69
Sun.	5	14 42 10.08	9.942	15 44 54.2	45.53	16 17.17	0.085	14 58 27.25
Mon.	6	14 46 9.10	9.977	16 2 59.1	44.88	16 14.70	0.120	15 2 23.80
Tues.	7	14 50 8.96	10.012	16 20 48.1	−44.20	16 11.39	0.155	15 6 20.35
Wed.	8	14 54 9.69	10.048	16 38 20.6	43.50	16 7.21	0.191	15 10 16.90
Thur.	9	14 58 11.26	10.083	16 55 36.3	42.79	16 2.20	0.226	15 14 13.46
Frid.	10	15 2 13.68	10.119	17 12 34.5	−42.06	15 56.33	0.262	15 18 10.01
Sat.	11	15 6 16.97	10.155	17 29 15.2	41.31	15 49.60	0.298	15 22 6.57
Sun.	12	15 10 21.10	10.190	17 45 37.7	40.56	15 42.03	0.333	15 26 3.13
Mon.	13	15 14 26.07	10.225	18 1 41.7	−39.77	15 33.62	0.368	15 29 59.69
Tues.	14	15 18 31.87	10.259	18 17 26.7	38.97	15 24.37	0.402	15 33 56.24
Wed.	15	15 22 38.51	10.294	18 32 52.5	38.15	15 14.29	0.437	15 37 52.80
Thur.	16	15 26 45.97	10.328	18 47 58.4	−37.33	15 3.38	0.471	15 41 49.35
Frid.	17	15 30 54.25	10.362	19 2 44.2	36.48	14 51.66	0.505	15 45 45.91
Sat.	18	15 35 3.35	10.396	19 17 9.6	35.63	14 39.12	0.539	15 49 42.46
Sun.	19	15 39 13.25	10.429	19 31 14.3	−34.75	14 25.77	0.572	15 53 39.02
Mon.	20	15 43 23.96	10.462	19 44 57.6	33.85	14 11.61	0.605	15 57 35.57
Tues.	21	15 47 35.44	10.495	19 58 19.3	32.95	13 56.69	0.638	16 1 32.13
Wed.	22	15 51 47.71	10.527	20 11 19.1	−32.02	13 40.97	0.670	16 5 28.68
Thur.	23	15 56 0.77	10.559	20 23 56.8	31.07	13 24.47	0.702	16 9 25.24
Frid.	24	16 0 14 59	10.591	20 36 11.6	30.13	13 7.20	0.734	16 13 21.79
Sat.	25	16 4 29.17	10.623	20 48 3.6	−29 16	12 49.18	0.766	16 17 18 35
Sun.	26	16 8 44.50	10.655	20 59 32.1	28.19	12 30.40	0.798	16 21 14.90
Mon.	27	16 13 0.56	10.685	21 10 37.1	27.20	12 10.90	0.828	16 25 11.46
Tues.	28	16 17 17.36	10.715	21 21 18.2	−26.20	11 50.66	0.858	16 29 8.02
Wed.	29	16 21 34.86	10.744	21 31 34.9	25.19	11 29.72	0.887	16 33 4.58
Thur.	30	16 25 53.05	10.772	21 41 27.2	24.16	11 8.08	0.915	16 37 1.13
Frid.	31	16 30 11.91	10.800	S. 21 50 54.7	−23.12	10 45.78	0.943	16 40 57.69

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
+ 9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	305	218 59 27.2	58 32.8	150.22	− 0.66	9.9964697	− 45.2	9 15 47.66
2	306	219 59 33.5	58 39.0	150.31	0.71	9.9963618	44.7	9 11 51.76
3	307	220 59 42.0	58 47.4	150.40	0.73	9.9962550	44.3	9 7 55.85
4	308	221 59 52.6	58 57.9	150.48	− 0.72	9.9961493	− 43.9	9 3 59.94
5	309	222 60 5.4	59 10.5	150.57	0.66	9.9960444	43.5	9 0 4.03
6	310	223 60 20.2	59 25.2	150.65	0.60	9.9959403	43.2	8 56 8.12
7	311	224 60 37.0	59 41.9	150.73	− 0.51	9.9958370	− 42.8	8 52 12.21
8	312	226 0 55.7	0 0.5	150.81	0.39	9.9957345	42.5	8 48 16.30
9	313	227 1 16.2	0 20.9	150.89	0.26	9.9956328	42.2	8 44 20.39
10	314	228 1 38.5	0 43.0	150.96	− 0.12	9.9955318	− 41.9	8 40 24.48
11	315	229 2 2.5	1 6.9	151.03	+ 0.02	9.9954315	41.6	8 36 28.58
12	316	230 2 28.2	1 32.4	151.10	0.15	9.9953319	41.3	8 32 32.67
13	317	231 2 55.4	1 59.5	151.16	+ 0.28	9.9952330	− 41.0	8 28 36.76
14	318	232 3 24.1	2 28.0	151.22	0.38	9.9951350	40.6	8 24 40.85
15	319	233 3 54.1	2 57.9	151.28	0.47	9.9950382	40.1	8 20 44.94
16	320	234 4 25.5	3 29.1	151.33	+ 0.51	9.9949425	− 39.6	8 16 49.03
17	321	235 4 58.2	4 1.7	151.39	0.53	9.9948481	39.0	8 12 53.12
18	322	236 5 32.1	4 35.5	151.44	0.52	9.9947552	38.4	8 8 57.21
19	323	237 6 7.2	5 10.5	151.48	+ 0.47	9.9946639	− 37.7	8 5 1.30
20	324	238 6 43.4	5 46.5	151.53	0.42	9.9945743	36.9	8 1 5.39
21	325	239 7 20.8	6 23.7	151.58	0.32	9.9944866	36.1	7 57 9.48
22	326	240 7 59.4	7 2.2	151.63	+ 0.22	9.9944010	− 35.2	7 53 13.57
23	327	241 8 39.3	7 42.0	151.69	+ 0.10	9.9943175	34.3	7 49 17.66
24	328	242 9 20.4	8 22.9	151.75	− 0.03	9.9942364	33.3	7 45 21.75
25	329	243 10 2.8	9 5.1	151.80	− 0.16	9.9941576	− 32.3	7 41 25.84
26	330	244 10 46.5	9 48.6	151.85	0.27	9.9940812	31.3	7 37 29.93
27	331	245 11 31.5	10 33.5	151.90	0.37	9.9940071	30.3	7 33 34.02
28	332	246 12 17.8	11 19.7	151.96	− 0.46	9.9939353	− 29.4	7 29 38.11
29	333	247 13 5.5	12 7.2	152.02	0.52	9.9938658	28.5	7 25 42.20
30	334	248 13 54.7	12 56.2	152.08	0.54	9.9937985	27.6	7 21 46.29
31	335	249 14 45.3	13 46.6	152.14	− 0.54	9.9937334	− 26.7	7 17 50.38

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 15.6	15 9.7	55 53.4	− 1.89	55 31.8	− 1.71	17 32.4	1.95	20.2
2	15 4.4	14 59.8	55 12.4	1.52	54 55.3	1.32	18 17.9	1.84	21.2
3	14 55.8	14 52.5	54 40.7	1.11	54 28.7	0.89	19 1.3	1.77	22.2
4	14 49.9	14 48.0	54 19.2	− 0.68	54 12.2	− 0.47	19 43.3	1.73	23.2
5	14 46.8	14 46.2	54 7.6	− 0.28	54 5.3	− 0.09	20 24.8	1.73	24.2
6	14 46.2	14 46.7	54 5.3	+ 0.09	54 7.4	+ 0.25	21 6.6	1.76	25.2
7	14 47.8	14 49.4	54 11.4	+ 0.40	54 17.2	+ 0.54	21 49.4	1.82	26.2
8	14 51.4	14 53.7	54 24.4	0.67	54 33.1	0.78	22 33.9	1.90	27.2
9	14 56.5	14 59.4	54 43.1	0.88	54 54.1	0.95	23 20.5	1.99	28.2
10	15 2.7	15 6.0	55 5 9	+ 1.01	55 18.4	+ 1.07	☌		29.2
11	15 9.7	15 13.4	55 31.6	1.12	55 45.3	1.16	0 9.5	2.09	0.5
12	15 17.2	15 21.1	55 59.3	1.18	56 13.6	1.20	1 0.6	2.17	1.5
13	15 25.0	15 29.0	56 28.1	+ 1.22	56 42.8	+ 1.23	1 53.3	2.22	2.5
14	15 33.1	15 37.2	56 57.6	1.24	57 12.6	1.26	2 46.8	2.23	3.5
15	15 41.3	15 45.4	57 27.8	1.27	57 43.0	1.27	3 40.2	2.21	4.5
16	15 49.6	15 53.7	57 58.2	+ 1.27	58 13.4	+ 1.26	4 33.0	2.18	5.5
17	15 57.8	16 1.8	58 28.4	1.24	58 43.2	1.22	5 24.9	2.14	6.5
18	16 5.7	16 9.5	58 57.6	1.17	59 11.3	1.10	6 16.2	2.12	7.5
19	16 12.9	16 16.1	59 24.0	+ 1.01	59 35.5	+ 0.89	7 7.3	2.14	8.5
20	16 18.8	16 20.9	59 45.4	0.74	59 53.3	0.57	7 59.1	2.18	9.5
21	16 22.4	16 23.3	59 58.9	+ 0.37	60 2.0	+ 0.14	8 52.3	2.25	10.5
22	16 23.3	16 22.5	60 2.2	− 0.11	59 59.3	− 0.38	9 47.4	2.34	11.5
23	16 20.9	16 18.4	59 53.2	0.64	59 44.0	0.89	10 44.3	2.41	12.5
24	16 15.0	16 10.9	59 31.7	1.14	59 16.5	1.37	11 42.5	2.44	13.5
25	16 6.0	16 0.6	58 58.7	− 1.58	58 38.6	− 1.75	12 40.8	2.41	14.5
26	15 54.6	15 48.3	58 16.8	1.87	57 53.7	1.96	13 37.7	2.32	15.5
27	15 41.8	15 35.3	57 29.8	2.00	57 5.6	2.01	14 32.0	2.19	16.5
28	15 28.7	15 22.4	56 41.7	− 1.97	56 18.4	− 1.89	15 23.0	2.05	17.5
29	15 16.4	15 10.8	55 56.3	1.78	55 35.7	1.65	16 10.8	1.92	18.5
30	15 5.7	15 1.1	55 16.9	1.48	55 0.2	1.30	16 55.8	1.82	19.5
31	14 57.2	14 53.9	54 45.7	− 1.11	54 33.7	− 0.89	17 38.8	1.76	20.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	WEDNESDAY 1.			
	h m s	s	° ′ ″	″
0	7 41 14.43	2.1368	N.16 36 24.9	6.626
1	7 43 22.49	2.1319	16 29 45.1	6.700
2	7 45 30.26	2.1270	16 23 0.9	6.772
3	7 47 37.73	2.1221	16 16 12.4	6.844
4	7 49 44.91	2.1172	16 9 19.6	6.916
5	7 51 51.80	2.1123	16 2 22.5	6.986
6	7 53 58.39	2.1074	15 55 21.3	7.054
7	7 56 4.69	2.1027	15 48 16.0	7.123
8	7 58 10.71	2.0979	15 41 6.6	7.191
9	8 0 16.44	2.0932	15 33 53.1	7.258
10	8 2 21.89	2.0885	15 26 35.6	7.324
11	8 4 27.06	2.0837	15 19 14.2	7.389
12	8 6 31.94	2.0790	15 11 48.9	7.453
13	8 8 36.54	2.0744	15 4 19.8	7.516
14	8 10 40.87	2.0699	14 56 47.0	7.578
15	8 12 44.93	2.0653	14 49 10.5	7.639
16	8 14 48.71	2.0608	14 41 30.3	7.701
17	8 16 52.22	2.0563	14 33 46.4	7.761
18	8 18 55.47	2.0519	14 25 59.0	7.819
19	8 20 58.45	2.0474	14 18 8.1	7.877
20	8 23 1.16	2.0430	14 10 13.7	7.935
21	8 25 3.61	2.0387	14 2 15.9	7.992
22	8 27 5.80	2.0343	13 54 14.7	8.048
23	8 29 7.73	2.0300	N.13 46 10.1	8.104
	THURSDAY 2.			
0	8 31 9.40	2.0258	N.13 38 2.2	8.158
1	8 33 10.82	2.0216	13 29 51.1	8.211
2	8 35 11.99	2.0175	13 21 36.9	8.264
3	8 37 12.92	2.0134	13 13 19.5	8.316
4	8 39 13.60	2.0093	13 4 59.0	8.367
5	8 41 14.04	2.0052	12 56 35.5	8.417
6	8 43 14.23	2.0012	12 48 8.9	8.467
7	8 45 14.19	1.9973	12 39 39.4	8.516
8	8 47 13.91	1.9934	12 31 7.0	8.564
9	8 49 13.40	1.9896	12 22 31.7	8.612
10	8 51 12.66	1.9857	12 13 53.5	8.659
11	8 53 11.69	1.9819	12 5 12.6	8.704
12	8 55 10.49	1.9782	11 56 29.0	8.749
13	8 57 9.07	1.9745	11 47 42.7	8.794
14	8 59 7.43	1.9709	11 38 53.7	8.838
15	9 1 5.58	1.9673	11 30 2.1	8.882
16	9 3 3.51	1.9638	11 21 7.9	8.924
17	9 5 1.23	1.9603	11 12 11.2	8.965
18	9 6 58.75	1.9569	11 3 12.1	9.006
19	9 8 56.06	1.9535	10 54 10.5	9.047
20	9 10 53.17	1.9501	10 45 6.5	9.086
21	9 12 50.07	1.9468	10 36 0.2	9.124
22	9 14 46.78	1.9436	10 26 51.6	9.163
23	9 16 43.30	1.9404	10 17 40.7	9.201
24	9 18 39.63	1.9373	N.10 8 27.5	9.237

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 3.			
	h m s	s	° ′ ″	″
0	9 18 39.63	1.9373	N.10 8 27.5	9.237
1	9 20 35.77	1.9342	9 59 12.2	9.273
2	9 22 31.73	1.9311	9 49 54.7	9.309
3	9 24 27.50	1.9280	9 40 35.1	9.344
4	9 26 23.09	1.9251	9 31 13.4	9.378
5	9 28 18.51	1.9222	9 21 49.7	9.412
6	9 30 13.76	1.9194	9 12 24.0	9.445
7	9 32 8.84	1.9166	9 2 56.3	9.477
8	9 34 3.75	1.9138	8 53 26.7	9.508
9	9 35 58.49	1.9111	8 43 55.3	9.538
10	9 37 53.08	1.9085	8 34 22.1	9.569
11	9 39 47.51	1.9058	8 24 47.0	9.600
12	9 41 41.78	1.9032	8 15 10.1	9.629
13	9 43 35.90	1.9008	8 5 31.5	9.657
14	9 45 29.88	1.8984	7 55 51.3	9.684
15	9 47 23.71	1.8960	7 46 9.4	9.711
16	9 49 17.40	1.8937	7 36 25.9	9.738
17	9 51 10.95	1.8914	7 26 40.8	9.765
18	9 53 4.37	1.8892	7 16 54.1	9.791
19	9 54 57.65	1.8869	7 7 5.9	9.815
20	9 56 50.80	1.8848	6 57 16.3	9.838
21	9 58 43.83	1.8828	6 47 25.3	9.862
22	10 0 36.73	1.8808	6 37 32.9	9.885
23	10 2 29.52	1.8788	N. 6 27 39.1	9.907
	SATURDAY 4.			
0	10 4 22.19	1.8768	N. 6 17 44.0	9.929
1	10 6 14.74	1.8750	6 7 47.6	9.950
2	10 8 7.19	1.8732	5 57 50.0	9.971
3	10 9 59.53	1.8714	5 47 51.1	9.992
4	10 11 51.76	1.8697	5 37 51.0	10.011
5	10 13 43.89	1.8681	5 27 49.8	10.029
6	10 15 35.93	1.8665	5 17 47.5	10.047
7	10 17 27.87	1.8649	5 7 44.1	10.065
8	10 19 19.72	1.8635	4 57 39.7	10.082
9	10 21 11.49	1.8621	4 47 34.3	10.098
10	10 23 3.17	1.8607	4 37 27.9	10.114
11	10 24 54.77	1.8594	4 27 20.6	10.130
12	10 26 46.30	1.8582	4 17 12.3	10.146
13	10 28 37.75	1.8569	4 7 3.1	10.159
14	10 30 29.13	1.8557	3 56 53.2	10.172
15	10 32 20.44	1.8546	3 46 42.5	10.185
16	10 34 11.68	1.8535	3 36 31.0	10.197
17	10 36 2.86	1.8525	3 26 18.8	10.210
18	10 37 53.98	1.8516	3 16 5.8	10.222
19	10 39 45.05	1.8507	3 5 52.2	10.232
20	10 41 36.06	1.8498	2 55 38.0	10.242
21	10 43 27.02	1.8490	2 45 23.2	10.252
22	10 45 17.94	1.8483	2 35 7.8	10.262
23	10 47 8.82	1.8476	2 24 51.8	10.271
24	10 48 59.65	1.8469	N. 2 14 35.3	10.278

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SUNDAY 5.					**TUESDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 48 59.65	1.8469	N. 2 14 35.3	10.278	0	12 17 54.01	1.8767	S. 5 57 10.8	9.988
1	10 50 50.44	1.8463	2 4 18.4	10.285	1	12 19 46.66	1.8784	6 7 9.5	9.968
2	10 52 41.21	1.8459	1 54 1.1	10.292	2	12 21 39.42	1.8803	6 17 6.9	9.947
3	10 54 31.95	1.8454	1 43 43.4	10.298	3	12 23 32.30	1.8822	6 27 3.1	9.925
4	10 56 22.66	1.8450	1 33 25.3	10.304	4	12 25 25.29	1.8842	6 36 57.9	9.902
5	10 58 13.35	1.8446	1 23 6.9	10.309	5	12 27 18.40	1.8861	6 46 51.3	9.878
6	11 0 4.01	1.8443	1 12 48.2	10.313	6	12 29 11.62	1.8881	6 56 43.3	9.855
7	11 1 54.66	1.8440	1 2 29.3	10.317	7	12 31 4.97	1.8902	7 6 33.9	9.831
8	11 3 45.29	1.8438	0 52 10.1	10.321	8	12 32 58.44	1.8923	7 16 23.0	9.805
9	11 5 35.91	1.8436	0 41 50.7	10.324	9	12 34 52.04	1.8944	7 26 10.5	9.778
10	11 7 26.52	1.8435	0 31 31.2	10.327	10	12 36 45.77	1.8966	7 35 56.4	9.752
11	11 9 17.13	1.8435	0 21 11.5	10.329	11	12 38 39.63	1.8988	7 45 40.7	9.725
12	11 11 7.74	1.8435	0 10 51.7	10.330	12	12 40 33.63	1.9011	7 55 23.4	9 697
13	11 12 58.35	1.8435	N. 0 0 31.9	10.330	13	12 42 27.76	1.9034	8 5 4.4	9.668
14	11 14 48.96	1.8436	S. 0 9 47.9	10.331	14	12 44 22.04	1.9058	8 14 43.6	9.639
15	11 16 39.58	1.8437	0 20 7.8	10.331	15	12 46 16.46	1.9082	8 24 21.1	9.610
16	11 18 30.21	1.8439	0 30 27.6	10.329	16	12 48 11.03	1.9107	8 33 56.8	9.579
17	11 20 20.85	1.8442	0 40 47.3	10.328	17	12 50 5.74	1.9131	8 43 30.6	9.548
18	11 22 11.51	1.8445	0 51 6.9	10.326	18	12 52 0.60	1.9156	8 53 2.5	9.516
19	11 24 2.19	1.8448	1 1 26.4	10.323	19	12 53 55.61	1.9182	9 2 32.5	9.483
20	11 25 52.89	1.8452	1 11 45.7	10.320	20	12 55 50.78	1.9208	9 12 0.5	9.450
21	11 27 43.62	1.8457	1 22 4.8	10.316	21	12 57 46.11	1.9234	9 21 26.5	9.416
22	11 29 34.38	1.8462	1 32 23.6	10.311	22	12 59 41.59	1.9261	9 30 50.4	9.381
23	11 31 25.17	1.8468	S. 1 42 42.1	10.307	23	13 1 37.24	1.9288	S. 9 40 12.2	9.345
	MONDAY 6.					**WEDNESDAY 8.**			
0	11 33 16.00	1.8474	S. 1 53 0.4	10.302	0	13 3 33.05	1.9316	S. 9 49 31.8	9.309
1	11 35 6.86	1.8480	2 3 18.3	10.295	1	13 5 29.03	1.9343	9 58 49.3	9.272
2	11 36 57.76	1.8488	2 13 35.8	10.288	2	13 7 25.17	1.9371	10 8 4.5	9.234
3	11 38 48.71	1.8496	2 23 52.9	10.281	3	13 9 21.48	1.9399	10 17 17.4	9.196
4	11 40 39.71	1.8504	2 34 9.5	10.273	4	13 11 17.96	1.9428	10 26 28.0	9.157
5	11 42 30.76	1.8512	2 44 25.6	10.264	5	13 13 14.62	1.9457	10 35 36.2	9.117
6	11 44 21.86	1.8521	2 54 41.2	10.256	6	13 15 11.45	1.9487	10 44 42.1	9.077
7	11 46 13.01	1.8530	3 4 56.3	10.246	7	13 17 8.46	1.9517	10 53 45.5	9.036
8	11 48 4.22	1.8541	3 15 10.7	10.235	8	13 19 5.65	1.9547	11 2 46.4	8.994
9	11 49 55.50	1.8552	3 25 24.5	10.224	9	13 21 3.02	1.9577	11 11 44.8	8.952
10	11 51 46.84	1.8563	3 35 37.6	10.213	10	13 23 0.58	1.9608	11 20 40.6	8.908
11	11 53 38.25	1.8574	3 45 50.0	10.201	11	13 24 58.32	1.9638	11 29 33.7	8.863
12	11 55 29.73	1.8586	3 56 1.7	10.188	12	13 26 56.24	1.9669	11 38 24.2	8.818
13	11 57 21.28	1.8599	4 6 12.6	10.175	13	13 28 54.35	1.9701	11 47 11.9	8.773
14	11 59 12.91	1.8612	4 16 22.7	10.161	14	13 30 52.66	1.9734	11 55 56.9	8.727
15	12 1 4.62	1.8625	4 26 31.9	10.147	15	13 32 51.16	1.9766	12 4 39.1	8.679
16	12 2 56.41	1.8638	4 36 40.3	10.132	16	13 34 49.85	1.9798	12 13 18.4	8.631
17	12 4 48.28	1.8652	4 46 47.7	10.116	17	13 36 48.74	1.9831	12 21 54.9	8.583
18	12 6 40.24	1.8667	4 56 54.2	10.100	18	13 38 47.82	1.9864	12 30 28.4	8.533
19	12 8 32.29	1.8683	5 6 59.7	10.083	19	13 40 47.10	1.9897	12 38 58.9	8.483
20	12 10 24.44	1.8699	5 17 4.1	10.065	20	13 42 46.58	1.9931	12 47 26.4	8.432
21	12 12 16.68	1.8715	5 27 7.5	10.047	21	13 44 46.27	1.9965	12 55 50.8	8.380
22	12 14 9.02	1.8732	5 37 9.8	10.028	22	13 46 46.16	1.9998	13 4 12.0	8.328
23	12 16 1.46	1.8749	5 47 10.9	10.008	23	13 48 46.25	2.0032	13 12 30.1	8.275
24	12 17 54.01	1.8767	S. 5 57 10.8	9.988	24	13 50 46.55	2.0067	S. 13 20 45.0	8.221

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	THURSDAY 9.					**SATURDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 50 46.55	2.0067	S. 13 20 45.0	8.221	0	15 31 16.29	2.1806	S. 18 38 15.9	4.712
1	13 52 47.06	2.0102	13 28 56.6	8.166	1	15 33 27.23	2.1841	18 42 55.9	4.621
2	13 54 47.77	2.0136	13 37 4.9	8.111	2	15 35 38.38	2.1875	18 47 30.4	4.528
3	13 56 48.69	2.0171	13 45 9.9	8.054	3	15 37 49.73	2.1908	18 51 59.3	4.435
4	13 58 49.82	2.0206	13 53 11.4	7.997	4	15 40 1.28	2.1942	18 56 22.6	4.342
5	14 0 51.16	2.0242	14 1 9.5	7.939	5	15 42 13.03	2.1975	19 0 40.3	4.247
6	14 2 52.72	2.0277	14 9 4.1	7.881	6	15 44 24.98	2.2008	19 4 52.3	4.152
7	14 4 54.49	2.0313	14 16 55.2	7.822	7	15 46 37.13	2.2041	19 8 58.6	4.057
8	14 6 56.48	2.0349	14 24 42.7	7.761	8	15 48 49.47	2.2073	19 12 59.1	3.961
9	14 8 58.68	2.0385	14 32 26.5	7.699	9	15 51 2.00	2.2105	19 16 53.9	3.864
10	14 11 1.10	2.0421	14 40 6.6	7.637	10	15 53 14.72	2.2137	19 20 42.8	3.767
11	14 13 3.73	2.0457	14 47 43.0	7.575	11	15 55 27.64	2.2168	19 24 25.9	3.669
12	14 15 6.58	2.0493	14 55 15.6	7.512	12	15 57 40.74	2.2198	19 28 3.1	3.570
13	14 17 9.65	2.0530	15 2 44.4	7.447	13	15 59 54.02	2.2229	19 31 34.3	3.470
14	14 19 12.94	2.0567	15 10 9.3	7.382	14	16 2 7.49	2.2260	19 34 59.5	3.371
15	14 21 16.45	2.0603	15 17 30.3	7.317	15	16 4 21.14	2.2289	19 38 18.8	3.271
16	14 23 20.18	2.0640	15 24 47.3	7.250	16	16 6 34.96	2.2318	19 41 32.0	3.169
17	14 25 24.13	2.0677	15 32 0.3	7.183	17	16 8 48.96	2.2348	19 44 39.1	3.067
18	14 27 28.30	2.0713	15 39 9.3	7.115	18	16 11 3.14	2.2377	19 47 40.0	2.964
19	14 29 32.69	2.0750	15 46 14.1	7.046	19	16 13 17.49	2.2405	19 50 34.8	2.862
20	14 31 37.30	2.0787	15 53 14.8	6.977	20	16 15 32.00	2.2433	19 53 23.4	2.759
21	14 33 42.14	2.0825	16 0 11.3	6.906	21	16 17 46.68	2.2460	19 56 5.9	2.656
22	14 35 47.20	2.0862	16 7 3.5	6.834	22	16 20 1.52	2.2487	19 58 42.1	2.551
23	14 37 52.48	2.0899	S. 16 13 51.4	6.762	23	16 22 16.52	2.2513	S. 20 1 12.0	2.446
	FRIDAY 10.					**SUNDAY 12.**			
0	14 39 57.99	2.0936	S. 16 20 35.0	6.690	0	16 24 31.68	2.2540	S. 20 3 35.6	2.341
1	14 42 3.72	2.0973	16 27 14.2	6.616	1	16 26 47.00	2.2566	20 5 52.9	2.235
2	14 44 9.67	2.1011	16 33 48.9	6.542	2	16 29 2.47	2.2590	20 8 3.8	2.128
3	14 46 15.85	2.1048	16 40 19.2	6.467	3	16 31 18.08	2.2614	20 10 8.3	2.021
4	14 48 22.25	2.1085	16 46 44.9	6.390	4	16 33 33.84	2.2639	20 12 6.4	1.914
5	14 50 28.87	2.1122	16 53 6.0	6.313	5	16 35 49.75	2.2663	20 13 58.0	1.806
6	14 52 35.71	2.1159	16 59 22.5	6.236	6	16 38 5.80	2.2687	20 15 43.1	1.697
7	14 54 42.77	2.1196	17 5 34.3	6.157	7	16 40 21.99	2.2709	20 17 21.7	1.589
8	14 56 50.06	2.1233	17 11 41.4	6.078	8	16 42 38.31	2.2731	20 18 53.8	1.481
9	14 58 57.57	2.1270	17 17 43.7	5.998	9	16 44 54.76	2.2752	20 20 19.4	1.372
10	15 1 5.30	2.1307	17 23 41.2	5.918	10	16 47 11.34	2.2774	20 21 38.4	1.262
11	15 3 13.25	2.1343	17 29 33.8	5.837	11	16 49 28.05	2.2795	20 22 50.8	1.152
12	15 5 21.42	2.1380	17 35 21.6	5.757	12	16 51 44.88	2.2815	20 23 56.6	1.042
13	15 7 29.81	2.1417	17 41 4.4	5.672	13	16 54 1.83	2.2834	20 24 55.8	0.931
14	15 9 38.42	2.1452	17 46 42.2	5.588	14	16 56 18.89	2.2853	20 25 48.3	0.819
15	15 11 47.24	2.1488	17 52 15.0	5.504	15	16 58 36.07	2.2872	20 26 34.1	0.707
16	15 13 56.28	2.1525	17 57 42.7	5.418	16	17 0 53.36	2.2890	20 27 13.2	0.596
17	15 16 5.54	2.1561	18 3 5.2	5.332	17	17 3 10.75	2.2908	20 27 45.6	0.484
18	15 18 15.01	2.1597	18 8 22.6	5.246	18	17 5 28.25	2.2925	20 28 11.3	0.372
19	15 20 24.70	2.1632	18 13 34.8	5.159	19	17 7 45.85	2.2941	20 28 30.2	0.259
20	15 22 34.60	2.1667	18 18 41.7	5.071	20	17 10 3.54	2.2957	20 28 42.4	0.147
21	15 24 44.71	2.1702	18 23 43.3	4.982	21	17 12 21.33	2.2972	20 28 47.8	− 0.033
22	15 26 55.03	2.1737	18 28 39.6	4.893	22	17 14 39.21	2.2987	20 28 46.4	+ 0.080
23	15 29 5.56	2.1772	18 33 30.5	4.803	23	17 16 57.17	2.3001	20 28 38.2	0.194
24	15 31 16.29	2.1806	S. 18 38 15.9	4.712	24	17 19 15.22	2.3015	S. 20 28 23.1	0.308

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	MONDAY 13.					**WEDNESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 19 15.22	2.3015	S. 20 28 23.1	0.308	0	19 10 15.08	2.3045	S. 18 2 23.0	5.714
1	17 21 33.35	2.3028	20 28 1.2	0.422	1	19 12 33.32	2.3036	17 56 37.0	5.819
2	17 23 51.55	2.3040	20 27 32.5	0.535	2	19 14 51.50	2.3025	17 50 44.7	5.924
3	17 26 9.83	2.3052	20 26 57.0	0.649	3	19 17 9.62	2.3014	17 44 46.1	6.029
4	17 28 28.18	2.3063	20 26 14.6	0.764	4	19 19 27.67	2.3003	17 38 41.2	6.134
5	17·30 46.59	2.3073	20 25 25.3	0.878	5	19 21 45.66	2.2993	17 32 30.0	6.238
6	17 33 5.06	2.3084	20 24 29.2	0.992	6	19 24 3.59	2.2982	17 26 12.6	6.341
7	17 35 23.60	2.3094	20 23 26.2	1.107	7	19 26 21.45	2.2970	17 19 49.1	6.443
8	17 37 42.19	2.3103	20 22 16.3	1.222	8	19 28 39.23	2.2957	17 13 19.4	6.546
9	17 40 0.83	2.3111	20 20 59.5	1.337	9	19 30 56.94	2.2945	17 6 43.6	6.647
10	17 42 19.52	2.3119	20 19 35.8	1.452	10	19 33 14.57	2.2933	17 0 1.7	6.748
11	17 44 38.26	2.3127	20 18 5.2	1.567	11	19 35 32.13	2.2921	16 53 13.8	6.849
12	17 46 57.04	2.3133	20 16 27.7	1.682	12	19 37 49.62	2.2908	16 46 19.8	6.949
13	17 49 15.86	2.3139	20 14 43.3	1.797	13	19 40 7.03	2.2895	16 39 19.9	7.048
14	17 51 34.71	2.3145	20 12 52.0	1.912	14	19 42 24.36	2.2882	16 32 14.1	7.147
15	17 53 53.60	2.3151	20 10 53.9	2.027	15	19 44 41.61	2.2869	16 25 2.3	7.245
16	17 56 12.52	2.3155	20 8 48.8	2.142	16	19 46 58.79	2.2856	16 17 44.7	7.342
17	17 58 31.46	2.3159	20 6 36.9	2.256	17	19 49 15.89	2.2843	16 10 21.3	7.438
18	18 0 50.43	2.3163	20 4 18.1	2.371	18	19 51 32.91	2.2830	16 2 52.2	7.533
19	18 3 9.42	2.3166	20 1 52.4	2.486	19	19 53 49.85	2.2816	15 55 17 3	7.629
20	18 5 28.42	2.3168	19 59 19.8	2.601	20	19 56 6.70	2.2802	15 47 36.7	7.724
21	18 7 47.43	2.3170	19 56 40.3	2.715	21	19 58 23.47	2.2788	15 39 50.4	7.818
22	18 10 6.46	2.3172	19 53 54.0	2.829	22	20 0 40.16	2.2774	15 31 58.5	7.911
23	18 12 25.49	2.3172	S. 19 51 0.8	2.943	23	20 2 56.76	2.2760	S. 15 24 1.1	8.004
	TUESDAY 14.					**THURSDAY 16.**			
0	18 14 44.52	2.3172	S. 19 48 0.8	3.058	0	20 5 13.28	2.2747	S. 15 15 58.1	8.096
1	18 17 3.55	2.3172	19 44 53.9	3.172	1	20 7 29.72	2.2733	15 7 49.6	8.187
2	18 19 22.58	2.3172	19 41 40.2	3.285	2	20 9 46.07	2.2718	14 59 35.7	8.277
3	18 21 41.61	2.3171	19 38 19.7	3.398	3	20 12 2.34	2.2704	14 51 16.4	8.367
4	18 24 0.63	2.3169	19 34 52.4	3.512	4	20 14 18.52	2.2690	14 42 51.7	8.456
5	18 26 19.64	2.3167	19 31 18.3	3.625	5	20 16 34.62	2.2677	14 34 21.7	8.544
6	18 28 38.63	2.3164	19 27 37.4	3.737	6	20 18 50.64	2.2663	14 25 46.5	8.631
7	18 30 57.61	2.3161	19 23 49.8	3.850	7	20 21 6.57	2.2648	14 17 6.0	8.717
8	18 33 16.56	2.3157	19 19 55.4	3.962	8	20 23 22.42	2.2634	14 8 20.4	8.802
9	18 35 35.49	2.3153	19 15 54.3	4.075	9	20 25 38.18	2.2620	13 59 29.7	8.887
10	18 37 54.40	2.3149	19 11 46.4	4.187	10	20 27 53.86	2.2607	13 50 33.9	8.972
11	18 40 13.28	2.3144	19 7 31.9	4.298	11	20 30 9.46	2.2593	13 41 33.1	9.055
12	18 42 32.13	2.3139	19 3 10.7	4.409	12	20 32 24.98	2.2580	13 32 27.3	9.138
13	18 44 50.95	2.3133	18 58 42.8	4.520	13	20 34 40.42	2.2566	13 23 16.5	9.220
14	18 47 9.73	2.3127	18 54 8.3	4.630	14	20 36 55.77	2.2552	13 14 0.9	9.300
15	18 49 28.47	2.3120	18 49 27.2	4.740	15	20 39 11.04	2.2538	13 4 40.5	9.380
16	18 51 47.17	2.3113	18 44 39.5	4.850	16	20 41 26.23	2.2526	12 55 15.3	9.460
17	18 54 5.83	2.3107	18 39 45.2	4.960	17	20 43 41.35	2.2513	12 45 45.3	9.538
18	18 56 24.45	2.3099	18 34 44.3	5.069	18	20 45 56.39	2.2500	12 36 10.7	9.615
19	18 58 43.02	2.3091	18 29 36.9	5.177	19	20 48 11.35	2.2487	12 26 31.5	9.692
20	19 1 1.54	2.3082	18 24 23.0	5.285	20	20 50 26.23	2.2474	12 16 47.7	9.768
21	19 3 20.01	2.3073	18 19 2.7	5.392	21	20 52 41.04	2.2462	12 6 59.3	9.843
22	19 5 38.42	2.3064	18 13 35.9	5.500	22	20 54 55.78	2.2450	11 57 6.5	9.917
23	19 7 56.78	2.3055	18 8 2.7	5.607	23	20 57 10.44	2.2438	11 47 9.3	9.990
24	19 10 15.08	2.3045	S. 18 2 23.0	5.714	24	20 59 25.03	2.2426	S. 11 37 7.7	10.062

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	FRIDAY 17.					SUNDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 59 25.03	2.2426	S. 11 37 7.7	10.062	0	22 46 17.03	2.2250	S. 2 29 26.9	12.356
1	21 1 39.55	2.2414	11 27 1.8	10.133	1	22 48 30.55	2.2257	2 17 4.9	12.377
2	21 3 54.00	2.2403	11 16 51.7	10.203	2	22 50 44.11	2.2264	2 4 41.7	12.397
3	21 6 8.39	2.2392	11 6 37.4	10.273	3	22 52 57.72	2.2272	1 52 17.3	12.415
4	21 8 22.71	2.2381	10 56 18.9	10.342	4	22 55 11.37	2.2279	1 39 51.9	12.432
5	21 10 36.96	2.2370	10 45 56.3	10.410	5	22 57 25.07	2.2288	1 27 25.5	12.448
6	21 12 51.15	2.2360	10 35 29.7	10.477	6	22 59 38.83	2.2298	1 14 58.1	12.463
7	21 15 5.28	2.2350	10 24 59.1	10.542	7	23 1 52.65	2.2308	1 2 29.9	12.477
8	21 17 19.35	2.2340	10 14 24.6	10.607	8	23 4 6.53	2.2318	0 50 0.9	12.489
9	21 19 33.36	2.2331	10 3 46.3	10.670	9	23 6 20.47	2.2329	0 37 31.2	12.501
10	21 21 47.32	2.2322	9 53 4.2	10.733	10	23 8 34.48	2.2340	0 25 0.8	12.511
11	21 24 1.22	2.2312	9 42 18.3	10.796	11	23 10 48.55	2.2351	S. 0 12 29.9	12.519
12	21 26 15.06	2.2303	9 31 28.7	10.857	12	23 13 2.69	2.2363	N. 0 0 1.5	12.527
13	21 28 28.85	2.2295	9 20 35.5	10.917	13	23 15 16.91	2.2376	0 12 33.3	12.533
14	21 30 42.60	2.2287	9 9 38.7	10.976	14	23 17 31.20	2.2389	0 25 5.5	12.538
15	21 32 56.30	2.2280	8 58 38.4	11.033	15	23 19 45.57	2.2403	0 37 37.9	12.542
16	21 35 9.96	2.2272	8 47 34.7	11.090	16	23 22 0.03	2.2417	0 50 10.5	12.544
17	21 37 23.57	2.2265	8 36 27.6	11.147	17	23 24 14.57	2.2431	1 2 43.2	12.546
18	21 39 37.14	2.2258	8 25 17.1	11.202	18	23 26 29.20	2.2446	1 15 16.0	12.547
19	21 41 50.67	2.2252	8 14 3.4	11.255	19	23 28 43.92	2.2462	1 27 48.8	12.545
20	21 44 4.17	2.2247	8 2 46.5	11.308	20	23 30 58.74	2.2477	1 40 21.4	12.542
21	21 46 17.63	2.2241	7 51 26.4	11.361	21	23 33 13.65	2.2493	1 52 53.8	12.538
22	21 48 31.06	2.2236	7 40 3.2	11.412	22	23 35 28.66	2.2510	2 5 26.0	12.533
23	21 50 44.46	2.2231	S. 7 28 37.0	11.462	23	23 37 43.77	2.2527	N. 2 17 57.8	12.526
	SATURDAY 18.					MONDAY 20.			
0	21 52 57.83	2.2227	S. 7 17 7.8	11.511	0	23 39 58.99	2.2545	N. 2 30 29.1	12.518
1	21 55 11.18	2.2222	7 5 35.7	11.558	1	23 42 14.31	2.2564	2 42 59.9	12.509
2	21 57 24.50	2.2218	6 54 0.8	11.605	2	23 44 29.75	2.2583	2 55 30.2	12.499
3	21 59 37.80	2.2215	6 42 23.1	11.651	3	23 46 45.31	2.2602	3 7 59.8	12.487
4	22 1 51.08	2.2213	6 30 42.7	11.695	4	23 49 0.98	2.2622	3 20 28.7	12.474
5	22 4 4.35	2.2211	6 18 59.7	11.738	5	23 51 16.77	2.2642	3 32 56.7	12.459
6	22 6 17.61	2.2209	6 7 14.1	11.781	6	23 53 32.68	2.2662	3 45 23.8	12.443
7	22 8 30.86	2.2207	5 55 26.0	11.822	7	23 55 48.71	2.2682	3 57 49.9	12.427
8	22 10 44.10	2.2206	5 43 35.4	11.863	8	23 58 4.86	2.2703	4 10 15.0	12.408
9	22 12 57.33	2.2205	5 31 42.4	11.903	9	0 0 21.14	2.2725	4 22 38.9	12.388
10	22 15 10.56	2.2205	5 19 47.1	11.941	10	0 2 37.56	2.2747	4 35 1.6	12.367
11	22 17 23.79	2.2205	5 7 49.5	11.978	11	0 4 54.11	2.2770	4 47 22.9	12.343
12	22 19 37.02	2.2206	4 55 49.8	12.013	12	0 7 10.80	2.2793	4 59 42.8	12.319
13	22 21 50.26	2.2207	4 43 48.0	12.048	13	0 9 27.63	2.2817	5 12 1.2	12.294
14	22 24 3.51	2.2208	4 31 44.1	12.082	14	0 11 44.60	2.2841	5 24 18.1	12.268
15	22 26 16.76	2.2210	4 19 38.2	12.114	15	0 14 1.72	2.2865	5 36 33.4	12.241
16	22 28 30.03	2.2213	4 7 30.4	12.146	16	0 16 18.98	2.2888	5 48 47.0	12.211
17	22 30 43.32	2.2217	3 55 20.7	12.177	17	0 18 36.38	2.2912	6 0 58.7	12.179
18	22 32 56.63	2.2220	3 43 9.2	12.206	18	0 20 53.93	2.2938	6 13 8.5	12.147
19	22 35 9.96	2.2223	3 30 56.0	12.233	19	0 23 11.64	2.2964	6 25 16.3	12.113
20	22 37 23.31	2.2227	3 18 41.2	12.260	20	0 25 29.50	2.2990	6 37 22.1	12.078
21	22 39 36.69	2.2232	3 6 24.8	12.286	21	0 27 47.52	2.3017	6 49 25.7	12.042
22	22 41 50.10	2.2238	2 54 6.9	12.310	22	0 30 5.70	2.3043	7 1 27.1	12.004
23	22 44 3.55	2.2244	2 41 47.6	12.333	23	0 32 24.04	2.3069	7 13 26.2	11.965
24	22 46 17.03	2.2250	S. 2 29 26.9	12.356	24	0 34 42.53	2.3096	N. 7 25 22.9	11.924

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	0 34 42.53	2.3096	N. 7 25 22.9	11.924
1	0 37 1.19	2.3124	7 37 17.1	11.882
2	0 39 20.02	2.3152	7 49 8.8	11.839
3	0 41 39.01	2.3179	8 0 57.8	11.794
4	0 43 58.17	2.3208	8 12 44.1	11.747
5	0 46 17.51	2.3237	8 24 27.5	11.699
6	0 48 37.02	2.3266	8 36 8.0	11.650
7	0 50 56.70	2.3295	8 47 45.5	11.600
8	0 53 16.56	2.3325	8 59 20.0	11.548
9	0 55 36.60	2.3354	9 10 51.3	11.495
10	0 57 56.81	2.3383	9 22 19.4	11.441
11	1 0 17.19	2.3412	9 33 44.2	11.384
12	1 2 37.75	2.3442	9 45 5.5	11.326
13	1 4 58.50	2.3473	9 56 23.3	11.267
14	1 7 19.43	2.3503	10 7 37.6	11.207
15	1 9 40.54	2.3533	10 18 48.2	11.146
16	1 12 1.83	2.3564	10 29 55.1	11.083
17	1 14 23.31	2.3505	10 40 58.1	11.018
18	1 16 44.97	2.3625	10 51 57.2	10.952
19	1 19 6.81	2.3656	11 2 52.3	10.884
20	1 21 28.84	2.3687	11 13 43.3	10.816
21	1 23 51.06	2.3718	11 24 30.2	10.746
22	1 26 13.46	2.3749	11 35 12.8	10.674
23	1 28 36.05	2.3781	N.11 45 51.1	10.602

WEDNESDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	1 30 58.83	2.3812	N.11 56 25.0	10.528
1	1 33 21.79	2.3843	12 6 54.4	10.452
2	1 35 44.94	2.3874	12 17 19.2	10.374
3	1 38 8.28	2.3905	12 27 39.3	10.296
4	1 40 31.80	2.3935	12 37 54.7	10.217
5	1 42 55.50	2.3966	12 48 5.3	10.136
6	1 45 19.39	2.3997	12 58 11.0	10.053
7	1 47 43.46	2.4027	13 8 11.7	9.969
8	1 50 7.72	2.4058	13 18 7.3	9.884
9	1 52 32.16	2.4088	13 27 57.8	9.798
10	1 54 56.78	2.4119	13 37 43.1	9.711
11	1 57 21.59	2.4150	13 47 23.1	9.622
12	1 59 46.58	2.4180	13 56 57.7	9.531
13	2 2 11.75	2.4209	14 6 26.8	9.440
14	2 4 37.09	2.4238	14 15 50.5	9.348
15	2 7 2.61	2.4267	14 25 8.6	9.254
16	2 9 28.30	2.4297	14 34 21.0	9.158
17	2 11 54.17	2.4326	14 43 27.6	9.062
18	2 14 20.21	2.4354	14 52 28.4	8.964
19	2 16 46.42	2.4382	15 1 23.3	8.866
20	2 19 12.80	2.4410	15 10 12.3	8.766
21	2 21 39.34	2.4437	15 18 55.2	8.664
22	2 24 6.04	2.4464	15 27 32.0	8.562
23	2 26 32.91	2.4491	15 36 2.6	8.458
24	2 28 59.94	2.4517	N.15 44 27.0	8.354

THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	2 28 59.94	2.4517	N.15 44 27.0	8.354
1	2 31 27.12	2.4543	15 52 45.1	8.248
2	2 33 54.46	2.4569	16 0 56.8	8.142
3	2 36 21.95	2.4594	16 9 2.1	8.033
4	2 38 49.59	2.4619	16 17 0.8	7.924
5	2 41 17.38	2.4643	16 24 53.0	7.815
6	2 43 45.31	2.4667	16 32 38.6	7.704
7	2 46 13.38	2.4690	16 40 17.5	7.592
8	2 48 41.59	2.4712	16 47 49.6	7.478
9	2 51 9.93	2.4734	16 55 14.9	7.364
10	2 53 38.40	2.4755	17 2 33.3	7.249
11	2 56 6.99	2.4776	17 9 44.8	7.133
12	2 58 35.71	2.4797	17 16 49.3	7.017
13	3 1 4.55	2.4816	17 23 46.8	6.899
14	3 3 33.50	2.4835	17 30 37.2	6.780
15	3 6 2.57	2.4854	17 37 20.4	6.660
16	3 8 31.75	2.4872	17 43 56.4	6.540
17	3 11 1.03	2.4888	17 50 25.2	6.419
18	3 13 30.41	2.4905	17 56 46.7	6.297
19	3 15 59.89	2.4921	18 3 0.8	6.174
20	3 18 29.46	2.4935	18 9 7.6	6.051
21	3 20 59.11	2.4949	18 15 7.0	5.927
22	3 23 28.85	2.4963	18 20 58.9	5.802
23	3 25 58.67	2.4976	N.18 26 43.2	5.676

FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	3 28 28.56	2.4987	N.18 32 20.0	5.550
1	3 30 58.52	2.4998	18 37 49.2	5.423
2	3 33 28.54	2.5009	18 43 10.8	5.296
3	3 35 58.63	2.5019	18 48 24.7	5.168
4	3 38 28.77	2.5027	18 53 30.9	5.039
5	3 40 58.95	2.5034	18 58 29.4	4.910
6	3 43 29.18	2.5041	19 3 20.1	4.780
7	3 45 59.45	2.5047	19 8 3.0	4.650
8	3 48 29.75	2.5052	19 12 38.1	4.520
9	3 51 0.08	2.5057	19 17 5.4	4.389
10	3 53 30.43	2.5060	19 21 24.8	4.258
11	3 56 0.80	2.5063	19 25 36.3	4.126
12	3 58 31.19	2.5065	19 29 39.9	3.993
13	4 1 1.58	2.5066	19 33 35.5	3.861
14	4 3 31.98	2.5067	19 37 23.2	3.728
15	4 6 2.38	2.5065	19 41 2.9	3.595
16	4 8 32.76	2.5062	19 44 34.6	3.462
17	4 11 3.12	2.5058	19 47 58.3	3.328
18	4 13 33.46	2.5055	19 51 14.0	3.194
19	4 16 3.78	2.5051	19 54 21.6	3.060
20	4 18 34.07	2.5045	19 57 21.2	2.927
21	4 21 4.32	2.5038	20 0 12.8	2.792
22	4 23 34.53	2.5031	20 2 56.3	2.657
23	4 26 4.69	2.5022	20 5 31.7	2.523
24	4 28 34.80	2.5013	N.20 7 59.1	2.389

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SATURDAY 25.					**MONDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 28 34.80	2.5013	N.20 7 59.1	2.389	0	6 25 50.44	2.3545	N.19 32 52.4	3.650
1	4 31 4.85	2.5002	20 10 18.4	2.255	1	6 28 11.57	2.3497	19 29 10.1	3.759
2	4 33 34.83	2.4991	20 12 29.7	2.121	2	6 30 32.41	2.3450	19 25 21.3	3.867
3	4 36 4.74	2.4978	20 14 32.9	1.986	3	6 32 52.97	2.3402	19 21 26.0	3.975
4	4 38 34.57	2.4965	20 16 28.0	1.852	4	6 35 13.24	2.3354	19 17 24.3	4.082
5	4 41 4.32	2.4951	20 18 15.1	1.717	5	6 37 33.22	2.3306	19 13 16.2	4.187
6	4 43 33.98	2.4935	20 19 54.1	1.583	6	6 39 52.91	2.3257	19 9 1.9	4.291
7	4 46 3.54	2.4919	20 21 25.1	1.449	7	6 42 12.30	2.3207	19 4 41.3	4.396
8	4 48 33.00	2.4902	20 22 48.0	1.315	8	6 44 31.39	2.3158	19 0 14.4	4.499
9	4 51 2.36	2.4884	20 24 2.9	1.182	9	6 46 50.19	2.3108	18 55 41.4	4.600
10	4 53 31.61	2.4866	20 25 9.8	1.049	10	6 49 8.69	2.3057	18 51 2.4	4.701
11	4 56 0.75	2.4847	20 26 8.7	0.916	11	6 51 26.88	2.3006	18 46 17.3	4.802
12	4 58 29.77	2.4826	20 26 59.7	0.783	12	6 53 44.76	2.2955	18 41 26.2	4.901
13	5 0 58.66	2.4803	20 27 42.7	0.650	13	6 56 2.34	2.2904	18 36 29.2	4.998
14	5 3 27.41	2.4780	20 28 17.7	0.518	14	6 58 19.61	2.2853	18 31 26.4	5.095
15	5 5 56.02	2.4757	20 28 44.8	0.386	15	7 0 36.58	2.2802	18 26 17.8	5.191
16	5 8 24.49	2.4733	20 29 4.0	0.254	16	7 2 53.24	2.2751	18 21 3.5	5.286
17	5 10 52.81	2.4707	20 29 15.3	+ 0.123	17	7 5 9.59	2.2698	18 15 43.5	5.380
18	5 13 20.97	2.4680	20 29 18.8	− 0.008	18	7 7 25.62	2.2646	18 10 17.9	5.473
19	5 15 48.97	2.4653	20 29 14.4	0.138	19	7 9 41.34	2.2594	18 4 46.8	5.565
20	5 18 16.81	2.4626	20 29 2.2	0.268	20	7 11 56.75	2.2542	17 59 10.1	5.657
21	5 20 44.48	2.4597	20 28 42.3	0.397	21	7 14 11.85	2.2490	17 53 28.0	5.747
22	5 23 11.97	2.4567	20 28 14.6	0.527	22	7 16 26.63	2.2438	17 47 40.5	5.836
23	5 25 39.28	2.4537	N.20 27 39.1	0.656	23	7 18 41.10	2.2386	N.17 41 47.7	5.923
	SUNDAY 26.					**TUESDAY 28.**			
0	5 28 6.41	2.4506	N.20 26 55.9	0.783	0	7 20 55.26	2.2333	N.17 35 49.7	6.010
1	5 30 33.35	2.4473	20 26 5.1	0.910	1	7 23 9.10	2.2280	17 29 46.5	6.097
2	5 33 0.09	2.4440	20 25 6.7	1.037	2	7 25 22.62	2.2228	17 23 38.1	6.182
3	5 35 26.63	2.4407	20 24 0.6	1.164	3	7 27 35.83	2.2176	17 17 24.7	6.265
4	5 37 52.97	2.4372	20 22 47.0	1.289	4	7 29 48.73	2.2123	17 11 6.3	6.347
5	5 40 19.10	2.4337	20 21 25.9	1.414	5	7 32 1.31	2.2070	17 4 43.0	6.429
6	5 42 45.01	2.4301	20 19 57.3	1.539	6	7 34 13.57	2.2017	16 58 14.8	6.511
7	5 45 10.71	2.4265	20 18 21.2	1.662	7	7 36 25.52	2.1965	16 51 41.7	6.592
8	5 47 36.19	2.4227	20 16 37.8	1.785	8	7 38 37.15	2.1913	16 45 3.8	6.671
9	5 50 1.44	2.4189	20 14 47.0	1.907	9	7 40 48.47	2.1861	16 38 21.2	6.748
10	5 52 26.46	2.4150	20 12 48.9	2.029	10	7 42 59.48	2.1808	16 31 34.0	6.825
11	5 54 51.24	2.4111	20 10 43.5	2.150	11	7 45 10.17	2.1756	16 24 42.2	6.901
12	5 57 15.79	2.4071	20 8 30.9	2.270	12	7 47 20.55	2.1704	16 17 45.9	6.976
13	5 59 40.09	2.4030	20 6 11.1	2.389	13	7 49 30.62	2.1652	16 10 45.1	7.050
14	6 2 4.15	2.3989	20 3 44.2	2.508	14	7 51 40.38	2.1600	16 3 39.9	7.123
15	6 4 27.96	2.3947	20 1 10.1	2.627	15	7 53 49.82	2.1548	15 56 30.3	7.196
16	6 6 51.51	2.3904	19 58 28.9	2.744	16	7 55 58.96	2.1497	15 49 16.4	7.267
17	6 9 14.81	2.3861	19 55 40.8	2.859	17	7 58 7.79	2.1447	15 41 58.3	7.336
18	6 11 37.85	2.3817	19 52 45.8	2.974	18	8 0 16.32	2.1396	15 34 36.1	7.405
19	6 14 0.62	2.3773	19 49 43.9	3.089	19	8 2 24.54	2.1345	15 27 9.7	7.474
20	6 16 23.13	2.3729	19 46 35.1	3.203	20	8 4 32.46	2.1294	15 19 39.2	7.542
21	6 18 45.37	2.3684	19 43 19.5	3.317	21	8 6 40.07	2.1243	15 12 4.7	7.608
22	6 21 7.34	2.3638	19 39 57.1	3.428	22	8 8 47.38	2.1193	15 4 26.3	7.673
23	6 23 29.03	2.3592	19 36 28.1	3.539	23	8 10 54.39	2.1144	14 56 44.0	7.738
24	6 25 50.44	2.3545	N.19 32 52.4	3.650	24	8 13 1.11	2.1095	N.14 48 57.8	7.802

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	WEDNESDAY 29.					THURSDAY 30.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 13 1.11	2.1095	N.14 48 57.8	7.802	0	9 2 17.70	2.0005	N.11 25 41.2	9.055
1	8 15 7.53	2.1045	14 41 7.8	7.863	1	9 4 17.61	1.9965	11 16 36.6	9.097
2	8 17 13.65	2.0996	14 33 14.2	7.924	2	9 6 17.28	1.9926	11 7 29.6	9.138
3	8 19 19.48	2.0947	14 25 16.9	7.985	3	9 8 16.72	1.9886	10 58 20.1	9.178
4	8 21 25.01	2.0898	14 17 16.0	8.045	4	9 10 15.92	1.9847	10 49 8.2	9.217
5	8 23 30.25	2.0850	14 9 11.5	8.104	5	9 12 14.89	1.9809	10 39 54.0	9.256
6	8 25 35.21	2.0803	14 1 3.5	8.162	6	9 14 13.63	1.9772	10 30 37.5	9.294
7	8 27 39.89	2.0756	13 52 52.1	8.219	7	9 16 12.15	1.9734	10 21 18.7	9.331
8	8 29 44.28	2.0709	13 44 37.2	8.276	8	9 18 10.44	1.9697	10 11 57.8	9.367
9	8 31 48.39	2.0662	13 36 19.0	8.330	9	9 20 8.51	1.9661	10 2 34.7	9.403
10	8 33 52.22	2.0615	13 27 57.6	8.384	10	9 22 6.37	1.9625	9 53 9.5	9.438
11	8 35 55.77	2.0568	13 19 32.9	8.438	11	9 24 4.01	1.9589	9 43 42.2	9.472
12	8 37 59.04	2.0522	13 11 5.0	8.491	12	9 26 1.44	1.9555	9 34 12.9	9.505
13	8 40 2.04	2.0477	13 2 34.0	8.542	13	9 27 58.67	1.9521	9 24 41.6	9.537
14	8 42 4.77	2.0432	12 53 59.9	8.593	14	9 29 55.69	1.9486	9 15 8.4	9.569
15	8 44 7.23	2.0388	12 45 22.8	8.643	15	9 31 52.50	1.9452	9 5 33.3	9.600
16	8 46 9.43	2.0344	12 36 42.8	8.692	16	9 33 49.11	1.9419	8 55 56.4	9.631
17	8 48 11.36	2.0300	12 27 59.8	8.741	17	9 35 45.53	1.9387	8 46 17.6	9.662
18	8 50 13.03	2.0257	12 19 13.9	8.788	18	9 37 41.76	1.9356	8 36 37.0	9.691
19	8 52 14.44	2.0214	12 10 25.2	8.834	19	9 39 37.80	1.9324	8 26 54.7	9.719
20	8 54 15.60	2.0172	12 1 33.8	8.880	20	9 41 33.65	1.9293	8 17 10.8	9.746
21	8 56 16.50	2.0129	11 52 39.6	8.926	21	9 43 29.32	1.9263	8 7 25.2	9.773
22	8 58 17.15	2.0087	11 43 42.7	8.970	22	9 45 24.81	1.9234	7 57 38.0	9.799
23	9 0 17.55	2.0046	11 34 43.2	9.013	23	9 47 20.13	1.9205	7 47 49.3	9.825
24	9 2 17.70	2.0005	N.11 25 41.2	9.055	24	9 49 15.27	1.9176	N. 7 37 59.0	9.850

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter	2	6	57.9
● New Moon	10	11	19.6
☽ First Quarter	17	20	41.7
○ Full Moon	24	14	2.7

	d	h
☾ Apogee	5	18.0
☾ Perigee	21	18.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Arietis	W.	79° 17′ 39″	2867	80° 50′ 40″	2882	82° 23′ 22″	2896	83° 55′ 46″	2910
	Saturn	W.	60 24 5	2794	61 58 41	2808	63 32 58	2823	65 6 56	2837
	Aldebaran	W.	45 55 31	2835	47 29 13	2849	49 2 37	2863	50 35 43	2876
	Jupiter	W.	23 29 28	2837	25 3 8	2848	26 36 34	2859	28 9 45	2871
	Regulus	E.	34 17 21	2888	32 44 47	2909	31 12 40	2931	29 41 1	2954
	Spica	E.	87 46 15	2817	86 12 9	2831	84 38 22	2846	83 4 54	2860
	Sun	E.	104 39 38	3178	103 13 2	3193	101 46 45	3209	100 20 47	3225
2	Saturn	W.	72 52 26	2901	74 24 44	2912	75 56 47	2924	77 28 36	2935
	Aldebaran	W.	58 17 5	2939	59 48 35	2950	61 19 51	2961	62 50 53	2971
	Jupiter	W.	35 52 5	2926	37 23 51	2936	38 55 24	2946	40 26 45	2955
	Spica	E.	75 21 57	2925	73 50 10	2937	72 18 38	2948	70 47 20	2959
	Sun	E.	93 15 19	3295	91 51 2	3307	90 26 59	3320	89 3 11	3332
3	Aldebaran	W.	70 22 57	3018	71 52 48	3025	73 22 30	3032	74 52 3	3039
	Jupiter	W.	48 0 34	2999	49 30 48	3006	51 0 53	3013	52 30 50	3019
	Pollux	W.	29 45 9	3357	31 8 15	3336	32 31 45	3319	33 55 35	3303
	Spica	E.	63 14 4	3006	61 43 59	3014	60 14 4	3022	58 44 18	3029
	Sun	E.	82 7 22	3384	80 44 47	3392	79 22 21	3400	78 0 5	3408
4	Aldebaran	W.	82 17 49	3068	83 46 38	3072	85 15 22	3076	86 44 1	3078
	Jupiter	W.	59 58 42	3046	61 27 58	3050	62 57 9	3054	64 26 15	3056
	Pollux	W.	40 58 24	3254	42 23 29	3247	43 48 42	3242	45 14 1	3236
	Spica	E.	51 17 30	3057	49 48 28	3062	48 19 32	3066	46 50 41	3069
	Sun	E.	71 10 46	3439	69 49 14	3444	68 27 47	3448	67 6 25	3453
5	Jupiter	W.	71 51 2	3066	73 19 53	3066	74 48 44	3066	76 17 35	3066
	Pollux	W.	52 22 7	3214	53 48 0	3209	55 13 58	3205	56 40 1	3202
	Spica	E.	39 27 17	3080	37 58 43	3081	36 30 10	3082	35 1 38	3081
	Sun	E.	60 20 30	3463	58 59 25	3464	57 38 21	3465	56 17 18	3465
6	Jupiter	W.	83 42 2	3060	85 11 1	3057	86 40 3	3054	88 9 10	3051
	Pollux	W.	63 51 29	3179	65 18 3	3175	66 44 42	3170	68 11 27	3165
	Regulus	W.	26 49 35	3178	28 16 10	3166	29 43 0	3155	31 10 3	3145
	Spica	E.	27 38 46	3076	26 10 7	3073	24 41 25	3071	23 12 40	3068
	Sun	E.	49 31 54	3459	48 10 44	3456	46 49 31	3454	45 28 15	3451
7	Pollux	W.	75 26 45	3138	76 54 9	3133	78 21 39	3126	79 49 17	3120
	Regulus	W.	38 28 5	3102	39 56 12	3095	41 24 28	3087	42 52 54	3078
	Sun	E.	38 40 55	3430	37 19 12	3424	35 57 23	3419	34 35 28	3413
8	Pollux	W.	87 9 19	3088	88 37 43	3082	90 6 15	3075	91 34 55	3068
	Regulus	W.	50 17 31	3039	51 46 56	3030	53 16 31	3023	54 46 15	3015
	Sun	E.	27 44 9	3381	26 21 31	3373	24 58 44	3366	23 35 49	3359
12	Sun	W.	17 41 1	3103	19 9 7	3094	20 37 24	3084	22 5 53	3075
	α Aquilæ	E.	57 1 24	3358	55 38 19	3373	54 15 32	3391	52 53 5	3411
	Fomalhaut	E.	85 29 42	3225	84 4 3	3220	82 38 18	3215	81 12 27	3211
	α Pegasi	E.	102 50 53	2902	101 18 37	2891	99 46 7	2882	98 13 25	2872
13	Sun	W.	29 31 4	3030	31 0 40	3021	32 30 27	3012	34 0 25	3002
	α Aquilæ	E.	46 7 43	3563	44 48 28	3607	43 30 1	3657	42 12 28	3713
	Fomalhaut	E.	74 2 15	3203	72 36 9	3204	71 10 4	3205	69 44 1	3209

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	α Arietis	W.	85 27 52	2924	86 59 41	2936	88 31 14	2950	90 2 30	2962
	Saturn	W.	66 40 36	2850	68 13 59	2864	69 47 4	2876	71 19 53	2889
	Aldebaran	W.	52 8 32	2890	53 41 4	2902	55 13 20	2915	56 45 20	2927
	Jupiter	W.	29 42 41	2882	31 15 23	2893	32 47 51	2904	34 20 5	2915
	Regulus	E.	28 9 50	2977	26 39 9	3003	25 9 0	3030	23 39 24	3060
	Spica	E.	81 31 44	2874	79 58 52	2887	78 26 17	2901	76 53 59	2913
	Sun	E.	98 55 7	3239	97 29 44	3254	96 4 39	3269	94 39 51	3282
2	Saturn	W.	79 0 11	2945	80 31 33	2954	82 2 43	2964	83 33 41	2972
	Aldebaran	W.	64 21 42	2981	65 52 18	2991	67 22 42	3000	68 52 55	3009
	Jupiter	W.	41 57 54	2965	43 28 51	2974	44 59 36	2983	46 30 10	2991
	Spica	E.	69 16 16	2969	67 45 25	2979	66 14 46	2989	64 44 19	2998
	Sun	E.	87 39 36	3343	86 16 14	3354	84 53 5	3365	83 30 8	3374
3	Aldebaran	W.	76 21 27	3046	77 50 43	3052	79 19 52	3057	80 48 54	3063
	Jupiter	W.	54 0 39	3026	55 30 20	3031	56 59 54	3037	58 29 21	3042
	Pollux	W.	35 19 43	3291	36 44 5	3280	38 8 40	3270	39 33 27	3261
	Spica	E.	57 14 41	3035	55 45 12	3042	54 15 51	3047	52 46 37	3053
	Sun	E.	76 37 58	3415	75 15 59	3423	73 54 8	3429	72 32 24	3434
4	Aldebaran	W.	88 12 37	3082	89 41 9	3084	91 9 38	3087	92 38 4	3088
	Jupiter	W.	65 55 18	3060	67 24 17	3061	68 53 14	3063	70 22 9	3065
	Pollux	W.	46 39 27	3231	48 4 59	3227	49 30 36	3222	50 56 19	3218
	Spica	E.	45 21 54	3073	43 53 11	3075	42 24 31	3077	40 55 53	3078
	Sun	E.	65 45 8	3455	64 23 54	3459	63 2 44	3461	61 41 36	3463
5	Jupiter	W.	77 46 26	3065	79 15 18	3065	80 44 11	3064	82 13 5	3061
	Pollux	W.	58 6 8	3198	59 32 20	3193	60 58 38	3188	62 25 1	3184
	Spica	E.	33 33 5	3081	32 4 32	3080	30 35 58	3079	29 7 23	3078
	Sun	E.	54 56 15	3465	53 35 12	3464	52 14 8	3463	50 53 2	3461
6	Jupiter	W.	89 38 19	3047	91 7 33	3044	92 36 51	3040	94 6 14	3035
	Pollux	W	69 38 18	3160	71 5 15	3155	72 32 18	3149	73 59 28	3143
	Regulus	W.	32 37 18	3136	34 4 44	3127	35 32 21	3119	37 0 8	3110
	Spica	E.	21 43 51	3065	20 14 59	3061	18 46 2	3058	17 17 1	3054
	Sun	E.	44 6 56	3447	42 45 33	3443	41 24 5	3439	40 2 33	3434
7	Pollux	W.	81 17 2	3114	82 44 55	3108	84 12 55	3101	85 41 3	3095
	Regulus	W.	44 21 30	3070	45 50 16	3063	47 19 11	3055	48 48 16	3047
	Sun	E.	33 13 26	3407	31 51 17	3401	30 29 2	3394	29 6 39	3388
8	Pollux	W.	93 3 44	3061	94 32 41	3055	96 1 46	3047	97 31 0	3041
	Regulus	W.	56 16 9	3007	57 46 13	2998	59 16 28	2990	60 46 53	2981
	Sun	E.	22 12 46	3351	20 49 34	3344	19 26 13	3335	18 2 42	3327
12	Sun	W.	23 34 33	3066	25 3 24	3057	26 32 26	3048	28 1 39	3039
	α Aquilæ	E.	51 31 1	3434	50 9 23	3461	48 48 15	3490	47 27 40	3525
	Fomalhaut	E.	79 46 31	3208	78 20 31	3204	76 54 27	3203	75 28 21	3203
	α Pegasi	E.	96 40 30	2862	95 7 23	2854	93 34 5	2845	92 0 35	2835
13	Sun	W.	35 30 35	2993	37 0 56	2985	38 31 28	2975	40 2 12	2966
	α Aquilæ	E.	40 55 55	3777	39 40 29	3851	38 26 19	3933	37 13 33	4029
	Fomalhaut	E.	68 18 2	3213	66 52 8	3218	65 26 20	3225	64 0 41	3234

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	α Pegasi	E.	90° 26′ 53″	2827	88° 53′ 0″	2819	87° 18′ 57″	2811	85° 44′ 44″	2804
14	Sun	W.	41 33 7	2958	43 4 13	2948	44 35 31	2939	46 7 0	2930
	Fomalhaut	E.	62 35 12	3244	61 9 55	3256	59 44 52	3270	58 20 6	3286
	α Pegasi	E.	77 51 13	2769	76 16 4	2762	74 40 46	2756	73 5 21	2750
15	Sun	W.	53 47 20	2884	55 19 59	2875	56 52 50	2866	58 25 53	2856
	Venus	W.	26 3 1	2734	27 38 56	2704	29 15 30	2678	30 52 39	2655
	Fomalhaut	E.	51 21 54	3408	49 59 47	3443	48 38 19	3483	47 17 36	3528
	α Pegasi	E.	65 6 34	2729	63 30 32	2725	61 54 25	2722	60 18 15	2721
16	Sun	W.	66 14 8	2810	67 48 23	2800	69 22 51	2791	70 57 31	2781
	Venus	W.	39 5 39	2559	40 45 30	2543	42 25 44	2527	44 6 19	2512
	Fomalhaut	E.	40 48 38	3859	39 34 37	3956	38 22 14	4067	37 11 40	4193
	α Pegasi	E.	52 17 7	2722	50 40 57	2726	49 4 52	2732	47 28 54	2738
	α Arietis	E.	94 51 16	2525	93 10 37	2516	91 29 46	2507	89 48 43	2498
17	Sun	W.	78 53 59	2734	80 29 54	2724	82 6 2	2714	83 42 23	2705
	Venus	W.	52 34 21	2443	54 16 54	2430	55 59 46	2417	57 42 56	2405
	α Arietis	E.	81 20 23	2455	79 38 7	2447	77 55 39	2439	76 13 0	2431
	Saturn	E.	98 44 53	2382	97 0 53	2374	95 16 41	2365	93 32 16	2357
18	Sun	W.	91 47 16	2657	93 24 53	2649	95 2 42	2640	96 40 43	2630
	Venus	W.	66 23 8	2346	68 8 1	2334	69 53 11	2323	71 38 37	2312
	α Aquilæ	W.	35 35 33	3783	36 50 53	3658	38 8 25	3548	39 27 56	3450
	α Arietis	E.	67 36 55	2393	65 53 10	2386	64 9 15	2379	62 25 10	2373
	Saturn	E.	84 47 2	2313	83 1 21	2304	81 15 28	2296	79 29 22	2287
	Aldebaran	E.	100 41 49	2345	98 56 55	2336	97 11 48	2327	95 26 28	2319
19	Sun	W.	104 53 53	2587	106 33 6	2578	108 12 31	2570	109 52 7	2562
	Venus	W.	80 29 43	2260	82 16 42	2250	84 3 55	2241	85 51 22	2231
	α Aquilæ	W.	46 29 53	3090	47 58 15	3038	49 27 41	2989	50 58 7	2945
	α Arietis	E.	53 42 36	2346	51 57 43	2342	50 12 45	2339	48 27 42	2337
	Saturn	E.	70 35 52	2247	68 48 35	2239	67 1 6	2233	65 13 27	2225
	Aldebaran	E.	86 36 46	2278	84 50 14	2270	83 3 31	2263	81 16 37	2256
	Jupiter	E.	107 47 53	2245	106 0 32	2237	104 13 0	2229	102 25 16	2222
20	Sun	W.	118 12 44	2527	119 53 20	2520	121 34 5	2514	123 14 59	2508
	Venus	W.	94 51 58	2188	96 40 43	2181	98 29 39	2174	100 18 46	2167
	α Aquilæ	W.	58 42 46	2776	60 17 45	2750	61 53 19	2726	63 29 24	2704
	α Arietis	E.	39 42 0	2339	37 56 57	2344	36 12 1	2350	34 27 15	2359
	Saturn	E.	56 12 35	2192	54 23 56	2187	52 35 9	2181	50 46 13	2176
	Aldebaran	E.	72 19 31	2223	70 31 37	2217	68 43 35	2211	66 55 24	2206
	Jupiter	E.	93 23 55	2188	91 35 9	2182	89 46 14	2176	87 57 10	2170
21	α Aquilæ	W.	71 36 18	2622	73 14 43	2610	74 53 24	2600	76 32 19	2591
	Fomalhaut	W.	45 6 55	3217	46 32 44	3152	47 59 51	3094	49 28 8	3042
	Saturn	E.	41 39 53	2157	39 50 21	2154	38 0 44	2152	36 11 4	2151
	Aldebaran	E.	57 52 50	2186	56 4 2	2184	54 15 11	2182	52 26 17	2180
	Jupiter	E.	78 49 58	2149	77 0 13	2145	75 10 23	2143	73 20 29	2140
	Pollux	E.	100 13 15	2260	98 26 17	2256	96 39 13	2253	94 52 4	2250
22	Fomalhaut	W.	57 3 35	2654	58 36 53	2628	60 10 44	2605	61 45 6	2584

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
13	α Pegasi	E.	84° 10′ 21″	2796	82° 35′ 48″	2788	81° 1′ 5″	2782	79° 26′ 13″	2775
14	Sun	W.	47 38 41	2921	49 10 33	2912	50 42 37	2902	52 14 53	2894
	Fomalhaut	E.	56 55 38	3305	55 31 32	3325	54 7 50	3350	52 44 36	3378
	α Pegasi	E.	71 29 48	2746	69 54 9	2741	68 18 23	2736	66 42 31	2732
15	Sun	W.	59 59 8	2847	61 32 35	2838	63 6 14	2828	64 40 5	2819
	Venus	W.	32 30 20	2632	34 8 31	2612	35 47 9	2594	37 26 12	2577
	Fomalhaut	E.	45 57 43	3579	44 38 46	3636	43 20 51	3702	42 4 6	3775
	α Pegasi	E.	58 42 3	2719	57 5 49	2719	55 29 34	2719	53 53 20	2720
16	Sun	W.	72 32 24	2772	74 7 29	2763	75 42 46	2753	77 18 16	2743
	Venus	W.	45 47 16	2497	47 28 33	2483	49 10 10	2470	50 52 6	2456
	Fomalhaut	E.	36 3 7	4336	34 56 48	4503	33 52 59	4697	32 51 57	4921
	α Pegasi	E.	45 53 4	2746	44 17 25	2756	42 42 0	2770	41 6 53	2785
	α Arietis	E.	88 7 27	2489	86 25 59	2481	84 44 19	2472	83 2 27	2464
17	Sun	W.	85 18 56	2695	86 55 42	2686	88 32 41	2677	90 9 52	2667
	Venus	W.	59 26 24	2393	61 10 9	2380	62 54 12	2368	64 38 32	2357
	α Arietis	E.	74 30 9	2423	72 47 7	2415	71 3 54	2408	69 20 30	2400
	Saturn	E.	91 47 39	2348	90 2 49	2339	88 17 46	2330	86 32 30	2322
18	Sun	W.	98 18 57	2621	99 57 23	2612	101 36 1	2604	103 14 51	2595
	Venus	W.	73 24 19	2301	75 10 17	2291	76 56 30	2280	78 42 59	2270
	α Aquilæ	W.	40 49 16	3362	42 12 16	3283	43 36 47	3212	45 2 42	3148
	α Arietis	E.	60 40 56	2366	58 56 33	2360	57 12 1	2355	55 27 22	2350
	Saturn	E.	77 43 4	2279	75 56 34	2271	74 9 52	2263	72 22 58	2255
	Aldebaran	E.	93 40 56	2311	91 55 12	2302	90 9 15	2294	88 23 6	2286
19	Sun	W.	111 31 54	2555	113 11 51	2547	114 51 59	2540	116 32 17	2533
	Venus	W.	87 39 3	2223	89 26 57	2213	91 15 5	2205	93 3 25	2196
	α Aquilæ	W.	52 29 29	2905	54 1 42	3869	55 34 41	2835	57 8 24	2805
	α Arietis	E.	46 42 36	2335	44 57 27	2334	43 12 17	2334	41 27 7	2336
	Saturn	E.	63 25 37	2218	61 37 37	2211	59 49 26	2204	58 1 5	2198
	Aldebaran	E.	79 29 32	2249	77 42 17	2241	75 54 51	2235	74 7 16	2229
	Jupiter	E.	100 37 21	2214	98 49 15	2207	97 0 58	2200	95 12 31	2194
20	Sun	W.	124 56 1	2503	126 37 10	2498	128 18 26	2493	129 59 49	2489
	Venus	W.	102 8 3	2161	103 57 30	2155	105 47 6	2149	107 36 51	2143
	α Aquilæ	W.	65 5 58	2684	66 42 59	2666	68 20 24	2650	69 58 11	2635
	α Arietis	E.	32 42 42	2371	30 58 26	2387	29 14 33	2408	27 31 9	2432
	Saturn	E.	48 57 10	2172	47 8 0	2167	45 18 43	2164	43 29 21	2160
	Aldebaran	E.	65 7 6	2202	63 18 41	2198	61 30 10	2194	59 41 33	2190
	Jupiter	E.	86 7 58	2165	84 18 38	2161	82 29 11	2157	80 39 38	2152
21	α Aquilæ	W.	78 11 26	2583	79 50 44	2577	81 30 10	2572	83 9 43	2569
	Fomalhaut	W.	50 57 29	2995	52 27 48	2954	53 58 58	2917	55 30 55	2883
	Saturn	E.	34 21 22	2149	32 31 38	2149	30 41 53	2150	28 52 10	2152
	Aldebaran	E.	50 37 20	2179	48 48 21	2179	46 59 22	2179	45 10 23	2179
	Jupiter	E.	71 30 31	2138	69 40 30	2137	67 50 27	2136	66 0 23	2136
	Pollux	E.	93 4 51	2247	91 17 34	2246	89 30 15	2245	87 42 54	2244
22	Fomalhaut	W.	63 19 55	2766	64 55 7	2751	66 30 39	2738	68 6 29	2727

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
22	α Pegasi	W.	37° 2′ 53″	2576	38° 42′ 21″	2545	40° 22′ 32″	2518	42° 3′ 20″	2494
	Aldebaran	E.	43 21 24	2180	41 32 27	2183	39 43 34	2186	37 54 45	2189
	Jupiter	E.	64 10 18	2136	62 20 13	2136	60 30 8	2137	58 40 5	2138
	Pollux	E.	85 55 32	2245	84 8 11	2245	82 20 51	2247	80 33 34	2249
23	Fomalhaut	W.	69 42 33	2718	71 18 49	2711	72 55 14	2706	74 31 46	2702
	α Pegasi	W.	50 33 59	2424	52 17 0	2417	54 0 11	2411	55 43 30	2407
	Jupiter	E.	49 30 42	2155	47 41 6	2159	45 51 37	2165	44 2 16	2171
	Pollux	E.	71 38 19	2271	69 51 37	2278	68 5 5	2286	66 18 45	2295
	Regulus	E.	108 12 48	2200	106 24 20	2204	104 35 58	2208	102 47 43	2214
24	Fomalhaut	W.	82 34 57	2708	84 11 26	2713	85 47 48	2720	87 24 1	2729
	α Pegasi	W.	64 20 50	2408	66 4 14	2412	67 47 32	2416	69 30 44	2422
	Jupiter	E.	34 58 12	2212	33 10 2	2222	31 22 7	2233	29 34 28	2245
	Pollux	E.	57 30 34	2349	55 45 46	2363	54 1 18	2378	52 17 12	2395
	Regulus	E.	93 48 41	2248	92 1 25	2257	90 14 22	2266	88 27 32	2276
25	α Pegasi	W.	78 4 18	2463	79 46 23	2474	81 28 13	2485	83 9 48	2496
	α Arietis	W.	34 26 14	2460	36 8 24	2460	37 50 34	2462	39 32 41	2465
	Pollux	E.	43 43 8	2497	42 1 50	2522	40 21 7	2549	38 41 2	2580
	Regulus	E.	79 37 11	2331	77 51 57	2344	76 7 1	2357	74 22 24	2371
26	α Pegasi	W.	91 33 16	2565	93 12 59	2581	94 52 20	2596	96 31 20	2613
	α Arietis	W.	48 1 16	2504	49 42 23	2515	51 23 16	2526	53 3 53	2538
	Saturn	W.	30 43 1	2405	32 26 28	2419	34 9 36	2432	35 52 25	2446
	Regulus	E.	65 44 20	2443	64 1 46	2459	62 19 35	2475	60 37 46	2492
27	α Arietis	W.	61 22 36	2604	63 1 25	2619	64 39 54	2633	66 18 4	2649
	Saturn	W.	44 21 14	2524	46 1 54	2539	47 42 13	2554	49 22 11	2570
	Aldebaran	W.	27 53 47	2585	29 33 3	2596	31 12 3	2610	32 50 45	2623
	Regulus	E.	52 14 33	2577	50 35 6	2594	48 56 3	2612	47 17 25	2632
	Spica	E.	105 55 17	2542	104 15 2	2558	102 35 9	2574	100 55 38	2591
28	α Arietis	W.	74 23 47	2725	75 59 54	2740	77 35 41	2755	79 11 8	2771
	Saturn	W.	57 36 28	2651	59 14 14	2666	60 51 39	2682	62 28 43	2698
	Aldebaran	W.	40 59 36	2694	42 36 24	2708	44 12 53	2723	45 49 2	2739
	Jupiter	W.	20 46 36	2675	22 23 50	2684	24 0 51	2695	25 37 37	2708
	Regulus	E.	39 10 39	2728	37 34 36	2748	35 59 0	2769	34 23 52	2790
	Spica	E.	92 43 40	2672	91 6 23	2688	89 29 27	2704	87 52 52	2720
29	α Arietis	W.	87 3 22	2846	88 36 50	2860	90 10 0	2875	91 42 51	2889
	Saturn	W.	70 28 51	2774	72 3 53	2788	73 38 36	2803	75 13 0	2817
	Aldebaran	W.	53 44 51	2811	55 19 4	2825	56 52 59	2839	58 26 36	2853
	Jupiter	W.	33 37 13	2773	35 12 16	2786	36 47 2	2799	38 21 31	2812
	Spica	E.	79 55 11	2797	78 20 39	2811	76 46 26	2825	75 12 31	2840
	Sun	E.	124 54 31	3161	123 27 35	3177	122 0 58	3192	120 34 39	3208
30	Saturn	W.	83 0 36	2882	84 33 18	2894	86 5 44	2906	87 37 55	2917
	Aldebaran	W.	66 10 23	2918	67 42 19	2929	69 14 1	2940	70 45 29	2951
	Jupiter	W.	46 9 49	2873	47 42 42	2885	49 15 20	2896	50 47 44	2907
	Pollux	W.	25 54 45	3365	27 17 41	3332	28 41 15	3306	30 5 20	3284
	Spica	E.	67 27 24	2905	65 55 12	2918	64 23 16	2930	62 51 35	2941
	Sun	E.	113 27 33	3280	112 2 58	3293	110 38 38	3306	109 14 33	3319

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22	α Pegasi	W.	43° 44′ 41″	2475	45° 26′ 29″	2458	47° 8′ 41″	2445	48° 51′ 12″	2433
	Aldebaran	E.	36 6 1	2194	34 17 24	2199	32 28 55	2204	30 40 35	2212
	Jupiter	E.	56 50 4	2140	55 0 6	2143	53 10 13	2147	51 20 25	2150
	Pollux	E.	78 46 20	2252	76 59 10	2256	75 12 6	2261	73 25 9	2266
23	Fomalhaut	W.	76 8 24	2700	77 45 4	2700	79 21 44	2701	80 58 22	2704
	α Pegasi	W.	57 26 55	2404	59 10 24	2403	60 53 54	2404	62 37 23	2405
	Jupiter	E.	42 13 5	2178	40 24 4	2185	38 35 14	2193	36 46 36	2202
	Pollux	E.	64 32 38	2304	62 46 44	2313	61 1 4	2324	59 15 40	2337
	Regulus	E.	100 59 36	2219	99 11 37	2226	97 23 48	2233	95 36 9	2240
24	Fomalhaut	W.	89 0 3	2738	90 35 52	2749	92 11 27	2761	93 46 46	2774
	α Pegasi	W.	71 13 48	2428	72 56 43	2436	74 39 27	2444	76 21 59	2453
	Jupiter	E.	27 47 7	2258	26 0 5	2272	24 13 24	2287	22 27 6	2304
	Pollux	E.	50 33 30	2412	48 50 13	2431	47 7 22	2451	45 25 0	2472
	Regulus	E.	86 40 57	2286	84 54 37	2296	83 8 32	2307	81 22 43	2319
25	α Pegasi	W.	84 51 7	2509	86 32 8	2522	88 12 50	2536	89 53 13	2551
	α Arietis	W.	41 14 43	2471	42 56 37	2477	44 38 22	2486	46 19 55	2494
	Pollux	E.	37 1 39	2612	35 23 1	2649	33 45 12	2689	32 8 18	2734
	Regulus	E.	72 38 7	2384	70 54 10	2398	69 10 33	2412	67 27 16	2427
26	α Pegasi	W.	98 9 57	2630	99 48 11	2647	101 26 2	2665	103 3 29	2684
	α Arietis	W.	54 44 13	2551	56 24 16	2564	58 4 1	2577	59 43 28	2591
	Saturn	W.	37 34 54	2461	39 17 2	2477	40 58 48	2492	42 40 12	2508
	Regulus	E.	58 56 21	2508	57 15 19	2525	55 34 40	2542	53 54 25	2559
27	α Arietis	W.	67 55 53	2663	69 33 22	2678	71 10 31	2694	72 47 19	2709
	Saturn	W.	51 1 47	2587	52 41 0	2603	54 19 51	2619	55 58 20	2635
	Aldebaran	W.	34 29 9	2636	36 7 15	2650	37 45 2	2665	39 22 29	2680
	Regulus	E.	45 39 13	2650	44 1 26	2669	42 24 4	2688	40 47 8	2708
	Spica	E.	99 16 30	2607	97 37 44	2623	95 59 20	2640	94 21 19	2656
28	α Arietis	W.	80 46 14	2786	82 21 0	2801	83 55 27	2816	85 29 34	2831
	Saturn	W.	64 5 25	2713	65 41 47	2729	67 17 48	2744	68 53 29	2759
	Aldebaran	W.	47 24 50	2753	49 0 19	2768	50 35 29	2783	52 10 19	2797
	Jupiter	W.	27 14 6	2720	28 50 19	2734	30 26 14	2747	32 1 52	2760
	Regulus	E.	32 49 11	2812	31 14 59	2835	29 41 17	2859	28 8 6	2885
	Spica	E.	86 16 39	2736	84 40 47	2751	83 5 15	2766	81 30 3	2782
29	α Arietis	W.	93 15 24	2903	94 47 39	2916	96 19 37	2931	97 51 17	2943
	Saturn	W.	76 47 6	2831	78 20 54	2844	79 54 25	2857	81 27 39	2870
	Aldebaran	W.	59 59 55	2866	61 32 57	2880	63 5 42	2892	64 38 11	2905
	Jupiter	W	39 55 43	2825	41 29 39	2838	43 3 18	2850	44 36 41	2862
	Spica	E.	73 38 55	2854	72 5 37	2867	70 32 36	2880	68 59 52	2893
	Sun	E.	119 8 39	3223	117 42 57	3237	116 17 32	3252	114 52 24	3266
30	Saturn	W.	89 9 52	2928	90 41 35	2939	92 13 5	2949	93 44 22	2959
	Aldebaran	W.	72 16 43	2962	73 47 43	2973	75 18 29	2983	76 49 3	2992
	Jupiter	W.	52 19 54	2917	53 51 51	2927	55 23 35	2937	56 55 7	2946
	Pollux	W.	31 29 50	3266	32 54 41	3252	34 19 49	3241	35 45 10	3231
	Spica	E.	61 20 8	2952	59 48 55	2963	58 17 56	2973	56 47 9	2982
	Sun	E.	107 50 43	3331	106 27 7	3342	105 3 44	3352	103 40 33	3364

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	16 30 9.98	10.802	S. 21 50 50.5	−23.13	16 15.98	70.32	10 45.94	0.943
Sat.	2	16 34 29.57	10.830	21 59 53.1	22.07	16 16.12	70.40	10 22.96	0.970
Sun.	3	16 38 49.81	10.856	22 8 30.3	21.01	16 16.26	70.48	9 59.34	0.997
Mon.	4	16 43 10.67	10.881	22 16 41.8	−19.93	16 16.39	70.56	9 35.11	1.022
Tues.	5	16 47 32.12	10.905	22 24 27.4	18.85	16 16.52	70.64	9 10.29	1.046
Wed.	6	16 51 54.15	10.929	22 31 46.7	17.75	16 16.65	70.71	8 44.88	1.069
Thur.	7	16 56 16.70	10.950	22 38 39.7	−16.65	16 16.77	70.78	8 18.96	1.090
Frid.	8	17 0 39.75	10.970	22 45 6.1	15.53	16 16.89	70.84	7 52.55	1.110
Sat.	9	17 5 3.27	10.989	22 51 5.5	14.40	16 17.01	70.90	7 25.65	1.128
Sun.	10	17 9 27.23	11.007	22 56 37.9	−13.27	16 17.12	70.96	6 58.32	1.146
Mon.	11	17 13 51.60	11.023	23 1 43.1	12.13	16 17.23	71.01	6 30.59	1.162
Tues.	12	17 18 16.35	11.037	23 6 20.8	10.98	16 17.33	71.06	6 2.47	1.177
Wed.	13	17 22 41.42	11.050	23 10 31.0	− 9.83	16 17.43	71.10	5 34.03	1.190
Thur.	14	17 27 6.79	11.062	23 14 13.5	8.67	16 17.53	71.14	5 5.30	1.202
Frid.	15	17 31 32.43	11.073	23 17 28.2	7.51	16 17.62	71.18	4 36.30	1.213
Sat.	16	17 35 58.30	11.082	23 20 14.9	− 6.36	16 17.71	71.21	4 7.06	1.222
Sun.	17	17 40 24.36	11.090	23 22 33.6	5.18	16 17.80	71.24	3 37.64	1.229
Mon.	18	17 44 50.58	11.096	23 24 24.2	4.01	16 17.88	71.26	3 8.06	1.235
Tues.	19	17 49 16.93	11.100	23 25 46.6	− 2.84	16 17.95	71.28	2 38.35	1.239
Wed.	20	17 53 43.38	11.103	23 26 40.8	1.67	16 18.02	71.29	2 8.54	1.243
Thur.	21	17 58 9.88	11.105	23 27 6.7	− 0.49	16 18.08	71.30	1 38.68	1.244
Frid.	22	18 2 36.42	11.106	23 27 4.4	+ 0.69	16 18.14	71.30	1 8.78	1.245
Sat.	23	18 7 2.95	11.104	23 26 33.7	1.87	16 18.19	71.30	0 38.89	1.243
Sun.	24	18 11 29.44	11.102	23 25 34.8	3.05	16 18.24	71.29	0 9.04	1.242
Mon.	25	18 15 55.86	11.099	23 24 7.6	+ 4.23	16 18.28	71.28	0 20.75	1.238
Tues.	26	18 20 22.19	11.095	23 22 12.1	5.40	16 18.31	71.27	0 50.44	1.234
Wed.	27	18 24 48.41	11.089	23 19 48.4	6.57	16 18.34	71.25	1 20.02	1.229
Thur.	28	18 29 14.49	11.083	23 16 56.6	+ 7.75	16 18.36	71.22	1 49.45	1.223
Frid.	29	18 33 40.38	11.075	23 13 36.8	8.91	16 18.37	71.19	2 18.71	1.214
Sat.	30	18 38 6.07	11.065	23 9 49.0	10.07	16 18.38	71.16	2 47.77	1.204
Sun.	31	18 42 31.51	11.054	23 5 33.3	11.23	16 18.38	71.12	3 16.57	1.194
Mon.	32	18 46 56.68	11.043	S. 23 0 49.9	+12.39	16 18.38	71.08	3 45.11	1.182

Note.—The mean time of semidiameter passing may be found by subtracting $0^s.19$ from the sidereal time. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Subtracted from Mean Time.		
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	16 30 11.91	10.800	S. 21 50 54.7	−23.12	10 45.78	0.943	16 40 57.69
Sat.	2	16 34 31.46	10.827	21 59 56.9	22.06	10 22.79	0.970	16 44 54.25
Sun.	3	16 38 51.62	10.854	22 8 33.8	21.00	9 59.19	0.997	16 48 50.81
Mon.	4	16 43 12.41	10.879	22 16 45.0	−19.92	9 34.95	1.022	16 52 47.36
Tues.	5	16 47 33.79	10.902	22 24 30.3	18.84	9 10.13	1.045	16 56 43.92
Wed.	6	16 51 55 74	10.926	22 31 49.3	17.74	8 44.73	1.069	17 0 40.47
Thur.	7	16 56 18.22	10.947	22 38 42.0	−16.64	8 18.81	1.090	17 4 37.03
Frid.	8	17 0 41.18	10.967	22 45 8.1	15.52	7 52.41	1.110	17 8 33.59
Sat.	9	17 5 4.64	10.985	22 51 7.2	14.39	7 25.51	1.128	17 12 30.15
Sun.	10	17 9 28.51	11.003	22 56 39.4	−13.26	6 58.19	1.146	17 16 26.70
Mon.	11	17 13 52.80	11.019	23 1 44.4	12.12	6 30.46	1.162	17 20 23.26
Tues.	12	17 18 17.46	11.034	23 6 21.9	10.97	6 2.35	1.177	17 24 19.81
Wed.	13	17 22 42.45	11.047	23 10 31.9	− 9.82	5 33.92	1.190	17 28 16.37
Thur.	14	17 27 7.73	11.059	23 14 14.1	8.66	5 5.20	1.202	17 32 12.93
Frid.	15	17 31 33.28	11.070	23 17 28.7	7.50	4 36.21	1.213	17 36 9.49
Sat.	16	17 35 59.06	11.079	23 20 15 3	− 6.35	4 6.98	1.222	17 40 6.04
Sun.	17	17 40 25.03	11.086	23 22 33.9	5.18	3 37.57	1.229	17 44 2.60
Mon.	18	17 44 51.16	11.092	23 24 24.4	4.01	3 8.00	1.235	17 47 59.16
Tues.	19	17 49 17.41	11.096	23 25 46.7	− 2.84	2 38.31	1.239	17 51 55.72
Wed.	20	17 53 43.78	11.100	23 26 40.9	1.67	2 8.50	1.243	17 55 52.28
Thur.	21	17 58 10.19	11.102	23 27 6.7	− 0.49	1 38.65	1.244	17 59 48.84
Frid.	22	18 2 36.63	11.102	23 27 4.4	+ 0.69	1 8.76	1.245	18 3 45.39
Sat.	23	18 7 3.07	11.100	23 26 33.7	1.87	0 38.88	1.244	18 7 41.95
Sun.	24	18 11 29.47	11.098	23 25 34.8	3.05	0 9.04	1.242	18 11 38.51
Mon.	25	18 15 55.80	11.095	23 24 7.6	+ 4.23	0 20.73	1.238	18 15 35.07
Tues.	26	18 20 22.04	11.091	23 22 12.1	5.40	0 50.42	1.234	18 19 31.62
Wed.	27	18 24 48.17	11.086	23 19 48.6	6.57	1 19.99	1.229	18 23 28.18
Thur.	28	18 29 14.15	11.079	23 16 56.9	+ 7.75	1 49.41	1.223	18 27 24.74
Frid.	29	18 33 39.96	11.071	23 13 37.2	8.91	2 18.66	1.214	18 31 21.30
Sat.	30	18 38 5.56	11.061	23 9 49.5	10.07	2 47.71	1.204	18 35 17.85
Sun.	31	18 42 30.91	11.051	23 5 33.9	11.23	3 16.50	1.194	18 39 14.41
Mon.	32	18 46 55.99	11.039	S. 23 0 50.7	+12.38	3 45.03	1.182	18 43 10.96

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour,
+ $9^s.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	335	249 14 45.3	13 46.6	152.14	− 0.54	9.9937334	−26.7	7 17 50.38
2	336	250 15 37.3	14 38.5	152.19	0.51	9.9936705	25.9	7 13 54.47
3	337	251 16 30.6	15 31.7	152.25	0.44	9.9936095	25.1	7 9 58.56
4	338	252 17 25.3	16 26.2	152.30	− 0.35	9.9935504	−24.3	7 6 2.65
5	339	253 18 21.3	17 22.0	152.36	0.23	9.9934929	23.6	7 2 6.74
6	340	254 19 18.6	18 19.1	152.41	− 0.10	9.9934371	22.9	6 58 10.82
7	341	255 20 17.0	19 17.4	152.46	+ 0.04	9.9933829	−22.2	6 54 14.91
8	342	256 21 16.5	20 16.8	152.50	0.18	9.9933303	21.6	6 50 19.00
9	343	257 22 16.9	21 17.1	152.54	0.32	9.9932792	20.9	6 46 23.10
10	344	258 23 18.3	22 18.2	152.57	+ 0.45	9.9932297	−20.3	6 42 27.19
11	345	259 24 20.5	23 20.2	152.60	0.55	9.9931816	19.7	6 38 31.28
12	346	260 25 23.5	24 23.0	152.63	0.63	9.9931350	19.1	6 34 35.37
13	347	261 26 27.1	25 26.5	152.65	+ 0.69	9.9930899	−18.5	6 30 39.45
14	348	262 27 31.2	26 30.4	152.67	0.71	9.9930464	17.8	6 26 43.54
15	349	263 28 35.8	27 34.8	152.69	0.70	9.9930046	17.0	6 22 47.63
16	350	264 29 40.8	28 39.6	152.70	+ 0.66	9.9929647	−16.2	6 18 51.72
17	351	265 30 46.1	29 44.8	152.72	0.60	9.9929268	15.3	6 14 55.80
18	352	266 31 51.7	30 50.2	152.73	0 52	9.9928911	14.4	6 10 59.89
19	353	267 32 57.4	31 55.8	152.74	+ 0.41	9.9928578	−13.4	6 7 3.97
20	354	268 34 3.3	33 1.5	152.75	0.29	9.9928269	12.4	6 3 8.06
21	355	269 35 9.5	34 7.5	152.76	0.15	9.9927985	11.3	5 59 12.15
22	356	270 36 16.0	35 13.9	152.77	+ 0.02	9.9927728	−10.1	5 55 16.24
23	357	271 37 22.8	36 20.5	152.78	− 0.09	9.9927498	9.0	5 51 20.33
24	358	272 38 29.8	37 27.3	152.79	0.19	9.9927296	7.8	5 47 24.42
25	359	273 39 36.9	38 34.2	152.80	− 0.29	9.9927123	− 6.7	5 43 28.51
26	360	274 40 44.3	39 41.4	152.81	0.35	9.9926978	5.5	5 39 32.60
27	361	275 41 52.1	40 49.1	152.82	0.37	9.9926861	4.3	5 35 36.68
28	362	276 43 0.3	41 57.1	152.83	− 0.38	9.9926772	− 3.1	5 31 40.77
29	363	277 44 8.8	43 5.5	152.84	0.35	9.9926711	2.0	5 27 44.86
30	364	278 45 17.7	44 14.2	152.86	0.30	9.9926676	− 0.9	5 23 48.94
31	365	279 46 27.0	45 23.3	152.87	0.21	9.9926666	+ 0.1	5 19 53.03
32	366	280 47 36.6	46 32.7	152.89	− 0.11	9.9926680	+ 1.0	5 15 57.12

NOTE.—The numbers in column λ correspond to the true equinox of the date, in column λ′ to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
— $9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 57.2	14 53.9	54 45.7	− 1.11	54 33.7	− 0.89	17 38.8	1.76	20.5
2	14 51.3	14 49.5	54 24.3	0.68	54 17.5	0.45	18 20.7	1.73	21.5
3	14 48.4	14 48.0	54 13.4	− 0.23	54 11.9	− 0.02	19 2.3	1.74	22.5
4	14 48.2	14 49.2	54 12.9	+ 0.19	54 16.5	+ 0.40	19 44.5	1.78	23.5
5	14 50.8	14 53.0	54 22.4	0.59	54 30.6	0 76	20 28.1	1.86	24.5
6	14 55.8	14 59.0	54 40.7	0.92	54 52.6	1.06	21 13.7	1.96	25.5
7	15 2.7	15 6.7	55 6.1	+ 1.18	55 20.9	+ 1.28	22 1.8	2.06	26.5
8	15 11.1	15 15.6	55 36.8	1.35	55 53.4	1.40	22 52.6	2.16	27.5
9	15 20.2	15 24.9	56 10.4	1.43	56 27.6	1.43	23 45.6	2.25	28.5
10	15 29.6	15 34.2	56 44.8	+ 1.42	57 1.6	+ 1.37	δ		29.5
11	15 38.5	15 42.7	57 17.7	1.31	57 33.1	1.25	0 40.1	2.28	0.8
12	15 46.7	15 50.3	57 47.6	1.17	58 1.0	1.07	1 34.9	2.27	1.8
13	15 53.7	15 56.7	58 13.3	+ 0.97	58 24.4	+ 0.87	2 29.0	2.23	2.8
14	15 59.4	16 1.8	58 34.3	0.77	58 43.1	0.68	3 22.0	2.18	3.8
15	16 3.9	16 5.7	58 50.7	0.59	58 57.3	0.50	4 13.8	2.13	4.8
16	16 7.2	16 8.4	59 2.8	+ 0.41	59 7.3	+ 0.33	5 4.7	2.11	5.8
17	16 9.3	16 10.0	59 10.8	0.25	59 13.3	+ 0.16	5 55.3	2.12	6.8
18	16 10.4	16 10.4	59 14.6	+ 0.06	59 14.8	− 0.03	6 46.5	2.16	7.8
19	16 10.2	16 9.5	59 13.8	− 0.14	59 11.4	− 0.26	7 39.1	2.23	8.8
20	16 8.4	16 6.9	59 7.4	0.39	59 1.9	0.53	8 33.4	2.30	9 8
21	16 5.0	16 2.5	58 54.7	0.68	58 45.7	0.82	9 29.3	2.36	10.8
22	15 59.6	15 56.2	58 35.0	− 0.96	58 22.6	− 1.10	10 26.3	2.37	11.8
23	15 52.4	15 48.2	58 8.6	1.23	57 53.1	1.35	11 23.2	2.34	12.8
24	15 43.6	15 38.7	57 36.3	1.45	57 18.4	1.52	12 18.5	2.26	13.8
25	15 33.7	15 28.5	56 59.8	− 1.57	56 40.7	− 1.60	13 11.4	2.14	14.8
26	15 23.2	15 18.1	56 21.5	1.59	56 2.6	1.55	14 1.3	2.01	15 8
27	15 13.1	15 8.4	55 44.3	1.49	55 26.9	1.40	14 48.2	1.90	16.8
28	15 4.0	15 0.0	55 10.7	− 1.29	54 56.1	− 1.15	15 32.7	1.81	17.8
29	14 56.5	14 53.6	54 43.3	0.98	54 32.6	0.80	16 15.5	1.76	18.8
30	14 51.3	14 49.7	54 24.2	0.60	54 18.2	− 0.40	16 57.3	1.74	19.8
31	14 48.7	14 48.4	54 14.6	− 0.19	54 13.6	+ 0.03	17 39.2	1.75	20.8
32	14 48.9	14 50.1	54 15.2	+ 0.26	54 19.6	+ 0.48	18 21.8	1.80	21.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 1.					SUNDAY 3.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 49 15.27	1.9176	N. 7 37 59.0	9.850	0	11 19 4.09	1.8465	S. 0 31 53.5	10.340
1	9 51 10.24	1.9148	7 28 7.3	9.874	1	11 20 54.88	1.8465	0 42 13.8	10.336
2	9 53 5.05	1.9121	7 18 14.1	9.898	2	11 22 45.67	1.8464	0 52 33.8	10.332
3	9 54 59.69	1.9093	7 8 19.5	9.921	3	11 24 36.45	1.8464	1 2 53.6	10.328
4	9 56 54.17	1.9067	6 58 23.6	9.944	4	11 26 27.24	1.8466	1 13 13.1	10.323
5	9 58 48.49	1.9041	6 48 26.3	9.966	5	11 28 18.04	1.8467	1 23 32.3	10.317
6	10 0 42.66	1.9016	6 38 27.7	9.987	6	11 30 8.85	1.8469	1 33 51.1	10.310
7	10 2 36.68	1.8991	6 28 27.9	10.007	7	11 31 59.67	1.8471	1 44 9.5	10.303
8	10 4 30.55	1.8967	6 18 26.9	10.027	8	11 33 50.50	1.8473	1 54 27.5	10.296
9	10 6 24.28	1.8944	6 8 24.7	10.046	9	11 35 41.35	1.8477	2 4 45.1	10.289
10	10 8 17.87	1.8921	5 58 21.4	10.064	10	11 37 32.23	1.8482	2 15 2.2	10.281
11	10 10 11.33	1.8898	5 48 17.0	10.082	11	11 39 23.14	1.8487	2 25 18.8	10.272
12	10 12 4.65	1.8876	5 38 11.6	10.099	12	11 41 14.07	1.8492	2 35 34.8	10.262
13	10 13 57.84	1.8854	5 28 5.1	10.116	13	11 43 5.04	1.8498	2 45 50.2	10.252
14	10 15 50.90	1.8833	5 17 57.7	10.132	14	11 44 56.05	1.8504	2 56 5.0	10.242
15	10 17 43.84	1.8813	5 7 49.3	10.148	15	11 46 47.09	1.8511	3 6 19.2	10.231
16	10 19 36.66	1.8793	4 57 40.0	10.163	16	11 48 38.18	1.8519	3 16 32.7	10.219
17	10 21 29.36	1.8774	4 47 29.8	10.178	17	11 50 29.32	1.8527	3 26 45.4	10.206
18	10 23 21.95	1.8756	4 37 18.7	10.192	18	11 52 20.51	1.8536	3 36 57.4	10.193
19	10 25 14.43	1.8738	4 27 6.8	10.204	19	11 54 11.75	1.8545	3 47 8.6	10.180
20	10 27 6.81	1.8721	4 16 54.2	10.216	20	11 56 3.05	1.8555	3 57 19.0	10.167
21	10 28 59.08	1.8704	4 6 40.9	10.228	21	11 57 54.41	1.8565	4 7 28.6	10.152
22	10 30 51.25	1.8688	3 56 26.9	10.239	22	11 59 45.83	1.8576	4 17 37.3	10.137
23	10 32 43.33	1.8672	N. 3 46 12.2	10.251	23	12 1 37.32	1.8587	S. 4 27 45.1	10.122
SATURDAY 2.					MONDAY 4.				
0	10 34 35.31	1.8656	N. 3 35 56.8	10.262	0	12 3 28.88	1.8599	S. 4 37 51.9	10.106
1	10 36 27.20	1.8642	3 25 40.8	10.271	1	12 5 20.51	1.8612	4 47 57.8	10.089
2	10 38 19.01	1.8628	3 15 24.3	10.279	2	12 7 12.22	1.8625	4 58 2.6	10.072
3	10 40 10.74	1.8615	3 5 7.3	10.288	3	12 9 4.01	1.8638	5 8 6.4	10.054
4	10 42 2.39	1.8602	2 54 49.8	10.296	4	12 10 55.88	1.8652	5 18 9.1	10.036
5	10 43 53.96	1.8589	2 44 31.8	10.303	5	12 12 47.84	1.8667	5 28 10.7	10.017
6	10 45 45.46	1.8578	2 34 13.4	10.310	6	12 14 39.88	1.8682	5 38 11.1	9.997
7	10 47 36.89	1.8567	2 23 54.6	10.317	7	12 16 32.02	1.8697	5 48 10.3	9.977
8	10 49 28.26	1.8556	2 13 35.4	10.322	8	12 18 24.25	1.8713	5 58 8.3	9.957
9	10 51 19.56	1.8546	2 3 15.9	10.327	9	12 20 16.58	1.8730	6 8 5.1	9.936
10	10 53 10.81	1.8537	1 52 56.1	10.332	10	12 22 9.01	1.8748	6 18 0.6	9.914
11	10 55 2.00	1.8528	1 42 36.1	10.336	11	12 24 1.55	1.8766	6 27 54.7	9.891
12	10 56 53.14	1.8519	1 32 15.8	10.340	12	12 25 54.20	1.8784	6 37 47.5	9.868
13	10 58 44.23	1.8512	1 21 55.3	10.343	13	12 27 46.96	1.8802	6 47 38.9	9.844
14	11 0 35.28	1.8505	1 11 34.7	10.345	14	12 29 39.83	1.8821	6 57 28.8	9.820
15	11 2 26.29	1.8498	1 1 13.9	10.347	15	12 31 32.81	1.8841	7 7 17.3	9.796
16	11 4 17.26	1.8492	0 50 53.0	10.348	16	12 33 25.92	1.8862	7 17 4.3	9.770
17	11 6 8.20	1.8486	0 40 32.1	10.349	17	12 35 19.15	1.8882	7 26 49.7	9.744
18	11 7 59.10	1.8481	0 30 11.1	10.349	18	12 37 12.50	1.8903	7 36 33.6	9.718
19	11 9 49.97	1.8478	0 19 50.2	10.348	19	12 39 5.98	1.8925	7 46 15.9	9.691
20	11 11 40.83	1.8475	N. 0 9 29.3	10.348	20	12 40 59.60	1.8947	7 55 56.5	9.663
21	11 13 31.67	1.8472	S. 0 0 51.6	10.347	21	12 42 53.35	1.8970	8 5 35.4	9.634
22	11 15 22.49	1.8469	0 11 12.4	10.345	22	12 44 47.24	1.8993	8 15 12.6	9.605
23	11 17 13.30	1.8467	0 21 33.0	10.343	23	12 46 41.27	1.9017	8 24 48.0	9.575
24	11 19 4.09	1.8465	S. 0 31 53.5	10.340	24	12 48 35.44	1.9041	S. 8 34 21.6	9.544

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	TUESDAY 5.			
	h m s	s	° ′ ″	″
0	12 48 35.44	1.9041	S. 8 34 21.6	9.544
1	12 50 29.76	1.9066	8 43 53.3	9.513
2	12 52 24.23	1.9090	8 53 23.2	9.482
3	12 54 18.84	1.9115	9 2 51.2	9.450
4	12 56 13.61	1.9142	9 12 17.2	9.417
5	12 58 8.54	1.9168	9 21 41.2	9.384
6	13 0 3.63	1.9195	9 31 3.3	9.351
7	13 1 58.88	1.9222	9 40 23.3	9.315
8	13 3 54.30	1.9250	9 49 41.1	9.279
9	13 5 49.88	1.9278	9 58 56.8	9.243
10	13 7 45.63	1.9307	10 8 10.3	9.206
11	13 9 41.56	1.9336	10 17 21.5	9.169
12	13 11 37.66	1.9365	10 26 30.5	9.131
13	13 13 33.94	1.9395	10 35 37.2	9.092
14	13 15 30.40	1.9426	10 44 41.5	9.052
15	13 17 27.05	1.9457	10 53 43.4	9.012
16	13 19 23.88	1.9487	11 2 42.9	8.971
17	13 21 20.90	1.9518	11 11 39.9	8.929
18	13 23 18.10	1.9550	11 20 34.4	8.887
19	13 25 15.50	1.9583	11 29 26.3	8.844
20	13 27 13.10	1.9616	11 38 15.6	8.800
21	13 29 10.89	1.9649	11 47 2.3	8.756
22	13 31 8.88	1.9683	11 55 46.3	8.710
23	13 33 7.08	1.9717	S. 12 4 27.5	8.664
	WEDNESDAY 6.			
0	13 35 5.48	1.9751	S. 12 13 5.9	8.617
1	13 37 4.09	1.9786	12 21 41.5	8.569
2	13 39 2.91	1.9820	12 30 14.2	8.522
3	13 41 1.93	1.9854	12 38 44.1	8.473
4	13 43 1.16	1.9890	12 47 11.0	8.423
5	13 45 0.61	1.9926	12 55 34.9	8.373
6	13 47 0.28	1.9962	13 3 55.8	8.322
7	13 49 0.16	1.9998	13 12 13.6	8.270
8	13 51 0.26	2.0036	13 20 28.2	8.218
9	13 53 0.59	2.0073	13 28 39.7	8.165
10	13 55 1.14	2.0111	13 36 48.0	8.111
11	13 57 1.92	2.0148	13 44 53.0	8.055
12	13 59 2.92	2.0186	13 52 54.6	7.999
13	14 1 4.15	2.0224	14 0 52.9	7.943
14	14 3 5.61	2.0263	14 8 47.8	7.886
15	14 5 7.31	2.0302	14 16 39.2	7.828
16	14 7 9.24	2.0341	14 24 27.1	7.769
17	14 9 11.40	2.0380	14 32 11.5	7.710
18	14 11 13.80	2.0419	14 39 52.3	7.650
19	14 13 16.43	2.0458	14 47 29.5	7.588
20	14 15 19.30	2.0498	14 55 2.9	7.526
21	14 17 22.41	2.0538	15 2 32.6	7.463
22	14 19 25.76	2.0579	15 9 58.5	7.400
23	14 21 29.36	2.0620	15 17 20.6	7.336
24	14 23 33.20	2.0660	S. 15 24 38.8	7.271

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	THURSDAY 7.			
	h m s	s	° ′ ″	″
0	14 23 33.20	2.0660	S. 15 24 38.8	7.271
1	14 25 37.28	2.0700	15 31 53.1	7.205
2	14 27 41.60	2.0741	15 39 3.4	7.138
3	14 29 46.17	2.0782	15 46 9.6	7.070
4	14 31 50.99	2.0824	15 53 11.8	7.002
5	14 33 56.06	2.0866	16 0 9.8	6.932
6	14 36 1.38	2.0907	16 7 3.6	6.862
7	14 38 6.95	2.0949	16 13 53.2	6.791
8	14 40 12.77	2.0990	16 20 38.5	6.719
9	14 42 18.83	2.1031	16 27 19.5	6.647
10	14 44 25.14	2.1072	16 33 56.2	6.575
11	14 46 31.70	2.1114	16 40 28.5	6.501
12	14 48 38.51	2.1156	16 46 56.3	6.425
13	14 50 45.57	2.1198	16 53 19.5	6.349
14	14 52 52.89	2.1241	16 59 38.2	6.273
15	14 55 0.46	2.1283	17 5 52.3	6.196
16	14 57 8.28	2.1324	17 12 1.7	6.117
17	14 59 16.35	2.1366	17 18 6.4	6.038
18	15 1 24.67	2.1407	17 24 6.3	5.958
19	15 3 33.24	2.1449	17 30 1.4	5.878
20	15 5 42.06	2.1492	17 35 51.6	5.797
21	15 7 51.14	2.1533	17 41 37.0	5.715
22	15 10 0.46	2.1574	17 47 17.4	5.631
23	15 12 10.03	2.1616	S. 17 52 52.7	5.547
	FRIDAY 8.			
0	15 14 19.85	2.1657	S. 17 58 23.0	5.462
1	15 16 29.92	2.1699	18 3 48.2	5.377
2	15 18 40.24	2.1740	18 9 8.2	5.291
3	15 20 50.80	2.1781	18 14 23.1	5.204
4	15 23 1.61	2.1822	18 19 32.7	5.116
5	15 25 12.67	2.1863	18 24 37.0	5.027
6	15 27 23.97	2.1903	18 29 36.0	4.938
7	15 29 35.51	2.1944	18 34 29.6	4.847
8	15 31 47.30	2.1985	18 39 17.7	4.756
9	15 33 59.33	2.2025	18 44 0.3	4.664
10	15 36 11.60	2.2064	18 48 37.4	4.572
11	15 38 24.10	2.2104	18 53 9.0	4.480
12	15 40 36.84	2.2143	18 57 35.0	4.386
13	15 42 49.82	2.2182	19 1 55.3	4.290
14	15 45 3.03	2.2221	19 6 9.8	4.194
15	15 47 16.47	2.2259	19 10 18.6	4.098
16	15 49 30.14	2.2298	19 14 21.6	4.001
17	15 51 44.04	2.2336	19 18 18.7	3.904
18	15 53 58.17	2.2373	19 22 10.0	3.805
19	15 56 12.52	2.2410	19 25 55.3	3.705
20	15 58 27.09	2.2447	19 29 34.6	3.606
21	16 0 41.89	2.2484	19 33 8.0	3.506
22	16 2 56.90	2.2520	19 36 35.3	3.404
23	16 5 12.13	2.2556	19 39 56.4	3.302
24	16 7 27.57	2.2591	S. 19 43 11.4	3.199

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	SATURDAY 9.					**MONDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 7 27.57	2.2591	S. 19 43 11.4	3.199	0	17 58 58.21	2.3633	S. 20 8 25.4	2.283
1	16 9 43.22	2.2626	19 46 20.2	3.095	1	18 1 20.02	2.3638	20 6 4.8	2.403
2	16 11 59.08	2.2661	19 49 22.8	2.992	2	18 3 41.86	2.3643	20 3 37.0	2.522
3	16 14 15.15	2.2695	19 52 19.2	2.888	3	18 6 3.73	2.3648	20 1 2.1	2.642
4	16 16 31.42	2.2728	19 55 9.3	2.782	4	18 8 25.63	2.3652	19 58 20.0	2.762
5	16 18 47.89	2.2761	19 57 53.0	2.676	5	18 10 47.55	2.3654	19 55 30.7	2.881
6	16 21 4.56	2.2794	20 0 30.4	2.570	6	18 13 9.48	2.3656	19 52 34.3	2.999
7	16 23 21.42	2.2826	20 3 1.4	2.462	7	18 15 31.42	2.3657	19 49 30.8	3.118
8	16 25 38.47	2.2857	20 5 25.9	2.354	8	18 17 53.37	2.3658	19 46 20.1	3.237
9	16 27 55.71	2.2889	20 7 43.9	2.246	9	18 20 15.32	2.3658	19 43 2.3	3.356
10	16 30 13.14	2.2921	20 9 55.4	2.137	10	18 22 37.27	2.3657	19 39 37.4	3.474
11	16 32 30.76	2.2952	20 12 0.4	2.028	11	18 24 59.21	2.3656	19 36 5.4	3.592
12	16 34 48.56	2.2981	20 13 58.8	1.918	12	18 27 21.14	2.3654	19 32 26.4	3.709
13	16 37 6.53	2.3009	20 15 50.6	1.807	13	18 29 43.06	2.3652	19 28 40.3	3.827
14	16 39 24.67	2.3038	20 17 35.7	1.696	14	18 32 4.96	2.3649	19 24 47.1	3.945
15	16 41 42.99	2.3066	20 19 14.1	1.584	15	18 34 26.85	2.3646	19 20 46.9	4.062
16	16 44 1.47	2.3093	20 20 45.8	1.473	16	18 36 48.72	2.3642	19 16 39.7	4.178
17	16 46 20.11	2.3120	20 22 10.8	1.361	17	18 39 10.55	2.3636	19 12 25.5	4.295
18	16 48 38.91	2.3147	20 23 29.1	1.248	18	18 41 32.35	2.3630	19 8 4.3	4.411
19	16 50 57.87	2.3173	20 24 40.6	1.134	19	18 43 54.11	2.3624	19 3 36.2	4.526
20	16 53 16.98	2.3198	20 25 45.2	1.019	20	18 46 15.84	2.3618	18 59 1.2	4.642
21	16 55 36.24	2.3223	20 26 42.9	0.905	21	18 48 37.53	2.3611	18 54 19.2	4.757
22	16 57 55.65	2.3246	20 27 33.8	0.791	22	18 50 59.17	2.3603	18 49 30.4	4.871
23	17 0 15.20	2.3269	S. 20 28 17.8	0.675	23	18 53 20.76	2.3594	S. 18 44 34.7	4.985
	SUNDAY 10.					**TUESDAY 12.**			
0	17 2 34.88	2.3292	S. 20 28 54.8	0.559	0	18 55 42.30	2.3585	S. 18 39 32.2	5.098
1	17 4 54.70	2.3314	20 29 24.9	0.443	1	18 58 3.78	2.3575	18 34 22.9	5.211
2	17 7 14.65	2.3335	20 29 48.0	0.328	2	19 0 25.20	2.3565	18 29 6.9	5.323
3	17 9 34.72	2.3356	20 30 4.2	0.212	3	19 2 46.56	2.3555	18 23 44.1	5.436
4	17 11 54.92	2.3376	20 30 13.4	− 0.095	4	19 5 7.86	2.3545	18 18 14.6	5.548
5	17 14 15.23	2.3395	20 30 15.6	+ 0.022	5	19 7 29.10	2.3534	18 12 38.4	5.658
6	17 16 35.66	2.3414	20 30 10.7	0.140	6	19 9 50.27	2.3522	18 6 55.6	5.768
7	17 18 56.20	2.3432	20 29 58.8	0.258	7	19 12 11.36	2.3509	18 1 6.2	5.878
8	17 21 16.84	2.3449	20 29 39.8	0.376	8	19 14 32.37	2.3496	17 55 10.2	5.988
9	17 23 37.59	2.3466	20 29 13.7	0.494	9	19 16 53.31	2.3482	17 49 7.6	6.097
10	17 25 58.43	2.3482	20 28 40.5	0.612	10	19 19 14.16	2.3468	17 42 58.5	6.205
11	17 28 19.37	2.3497	20 28 0.2	0.731	11	19 21 34.93	2.3454	17 36 43.0	6.312
12	17 30 40.40	2.3512	20 27 12.8	0.850	12	19 23 55.61	2.3440	17 30 21.1	6.418
13	17 33 1.51	2.3525	20 26 18.2	0.969	13	19 26 16 21	2.3425	17 23 52.8	6.525
14	17 35 22.70	2.3538	20 25 16.5	1.088	14	19 28 36.71	2.3409	17 17 18.1	6.631
15	17 37 43.97	2.3551	20 24 7.7	1.207	15	19 30 57.12	2.3393	17 10 37.1	6.735
16	17 40 5.32	2.3564	20 22 51.7	1.327	16	19 33 17.43	2.3377	17 3 49.9	6.838
17	17 42 26.74	2.3575	20 21 28.5	1.446	17	19 35 37.64	2.3361	16 56 56.5	6.942
18	17 44 48.22	2.3585	20 19 58.2	1.565	18	19 37 57.76	2.3344	16 49 56.8	7.046
19	17 47 9.76	2.3594	20 18 20.7	1.685	19	19 40 17.77	2.3327	16 42 51.0	7.147
20	17 49 31.35	2.3603	20 16 36.0	1.805	20	19 42 37.68	2.3310	16 35 39.2	7.248
21	17 51 53.00	2.3612	20 14 44.1	1.925	21	19 44 57.49	2.3292	16 28 21.3	7.348
22	17 54 14.69	2.3619	20 12 45.0	2.044	22	19 47 17.19	2.3274	16 20 57.4	7.448
23	17 56 36.43	2.3626	20 10 38.8	2.163	23	19 49 36.78	2.3256	16 13 27.5	7.547
24	17 58 58.21	2.3633	S. 20 8 25.4	2.283	24	19 51 56.26	2.3237	S. 16 5 51.7	7.645

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 13.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	19 51 56.26	2.3237	S. 16 5 51.7	7.645
1	19 54 15.63	2.3218	15 58 10.1	7.742
2	19 56 34.88	2.3199	15 50 22.6	7.839
3	19 58 54.02	2.3180	15 42 29.4	7.934
4	20 1 13.04	2.3161	15 34 30.5	8.029
5	20 3 31.95	2.3142	15 26 25.9	8.123
6	20 5 50.74	2.3122	15 18 15.7	8.216
7	20 8 9.41	2.3102	15 10 0.0	8.308
8	20 10 27.96	2.3082	15 1 38.7	8.400
9	20 12 46.40	2.3062	14 53 12.0	8.490
10	20 15 4.71	2.3042	14 44 39.9	8.579
11	20 17 22.90	2.3021	14 36 2.5	8.667
12	20 19 40.96	2.3000	14 27 19.8	8.755
13	20 21 58.90	2.2980	14 18 31.9	8.842
14	20 24 16.72	2.2960	14 9 38.8	8.928
15	20 26 34.42	2.2939	14 0 40.5	9.013
16	20 28 51.99	2.2918	13 51 37.2	9.097
17	20 31 9.44	2.2897	13 42 28.9	9.180
18	20 33 26.76	2.2877	13 33 15.6	9.262
19	20 35 43.96	2.2856	13 23 57.4	9.343
20	20 38 1.03	2.2835	13 14 34.4	9.422
21	20 40 17.98	2.2814	13 5 6.7	9.501
22	20 42 34.80	2.2793	12 55 34.3	9.579
23	20 44 51.50	2.2773	S. 12 45 57.2	9.657

THURSDAY 14.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	20 47 8.08	2.2753	S. 12 36 15.5	9.733
1	20 49 24.54	2.2732	12 26 29.3	9.808
2	20 51 40.87	2.2712	12 16 38.6	9.881
3	20 53 57.08	2.2692	12 6 43.5	9.954
4	20 56 13.17	2.2672	11 56 44.1	10.027
5	20 58 29.14	2.2652	11 46 40.3	10.098
6	21 0 44.99	2.2632	11 36 32.3	10.167
7	21 3 0.72	2.2612	11 26 20.2	10.236
8	21 5 16.34	2.2593	11 16 4.0	10.304
9	21 7 31.84	2.2573	11 5 43.7	10.372
10	21 9 47.22	2.2554	10 55 19.4	10.438
11	21 12 2.49	2.2535	10 44 51.2	10.502
12	21 14 17.64	2.2516	10 34 19.2	10.565
13	21 16 32.68	2.2497	10 23 43.4	10.627
14	21 18 47.61	2.2479	10 13 3.9	10.689
15	21 21 2.43	2.2461	10 2 20.7	10.750
16	21 23 17.14	2.2443	9 51 33.9	10.808
17	21 25 31.75	2.2426	9 40 43.7	10.866
18	21 27 46.25	2.2408	9 29 50.0	10.923
19	21 30 0.65	2.2391	9 18 52.9	10.979
20	21 32 14.94	2.2373	9 7 52.5	11.034
21	21 34 29.13	2.2357	8 56 48.8	11.088
22	21 36 43.22	2.2341	8 45 41.9	11.141
23	21 38 57.22	2.2326	8 34 31.9	11.193
24	21 41 11.13	2.2311	S. 8 23 18.8	11.243

FRIDAY 15.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	21 41 11.13	2.2311	S. 8 23 18.8	11.243
1	21 43 24.95	2.2295	8 12 2.7	11.292
2	21 45 38.67	2.2279	8 0 43.7	11.340
3	21 47 52.30	2.2264	7 49 21.9	11.387
4	21 50 5.84	2.2250	7 37 57.3	11.433
5	21 52 19.30	2.2237	7 26 29.9	11.479
6	21 54 32.68	2.2223	7 14 59.8	11.523
7	21 56 45.98	2.2210	7 3 27.1	11.565
8	21 58 59.20	2.2197	6 51 52.0	11.606
9	22 1 12.34	2.2184	6 40 14.4	11.647
10	22 3 25.41	2.2173	6 28 34.4	11.687
11	22 5 38.41	2.2162	6 16 52.0	11.725
12	22 7 51.35	2.2151	6 5 7.4	11.762
13	22 10 4.22	2.2139	5 53 20.6	11.797
14	22 12 17.02	2.2128	5 41 31.7	11.832
15	22 14 29.76	2.2118	5 29 40.8	11.865
16	22 16 42.44	2.2109	5 17 47.9	11.898
17	22 18 55.07	2.2100	5 5 53.0	11.930
18	22 21 7.64	2.2091	4 53 56.3	11.960
19	22 23 20.16	2.2083	4 41 57.8	11.989
20	22 25 32.64	2.2076	4 29 57.6	12.017
21	22 27 45.07	2.2068	4 17 55.8	12.043
22	22 29 57.45	2.2061	4 5 52.4	12.069
23	22 32 9.80	2.2055	S. 3 53 47.5	12.093

SATURDAY 16.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	22 34 22.11	2.2049	S. 3 41 41.2	12.117
1	22 36 34.39	2.2043	3 29 33.5	12.139
2	22 38 46.63	2.2037	3 17 24.5	12.160
3	22 40 58.84	2.2033	3 5 14.3	12.179
4	22 43 11.03	2.2030	2 53 3.0	12.198
5	22 45 23.20	2.2027	2 40 50.5	12.217
6	22 47 35.35	2.2024	2 28 37.0	12.233
7	22 49 47.48	2.2021	2 16 22.6	12.248
8	22 51 59.60	2.2019	2 4 7.3	12.263
9	22 54 11.71	2.2017	1 51 51.1	12.276
10	22 56 23.81	2.2016	1 39 34.2	12.287
11	22 58 35.90	2.2015	1 27 16.6	12.297
12	23 0 47.99	2.2015	1 14 58.5	12.306
13	23 3 0.08	2.2016	1 2 39.9	12.314
14	23 5 12.18	2.2017	0 50 20.8	12.322
15	23 7 24.28	2.2019	0 38 1.2	12.329
16	23 9 36.40	2.2021	0 25 41.3	12.333
17	23 11 48.53	2.2023	0 13 21.2	12.337
18	23 14 0.67	2.2025	S. 0 1 0.9	12.339
19	23 16 12.83	2.2029	N. 0 11 19.5	12.341
20	23 18 25.02	2.2033	0 23 40.0	12.341
21	23 20 37.23	2.2037	0 36 0.4	12.339
22	23 22 49.47	2.2042	0 48 20.7	12.337
23	23 25 1.74	2.2048	1 0 40.9	12.334
24	23 27 14.05	2.2054	N. 1 13 0.8	12.329

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 17.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	23 27 14.05	2.2054	N. 1 13 0.8	12.329
1	23 29 26.39	2.2060	1 25 20.4	12.324
2	23 31 38.77	2.2068	1 37 39.7	12.317
3	23 33 51.20	2.2076	1 49 58.5	12.308
4	23 36 3.68	2.2084	2 2 16.7	12.299
5	23 38 16.21	2.2093	2 14 34.4	12.289
6	23 40 28.79	2.2102	2 26 51.4	12.277
7	23 42 41.43	2.2111	2 39 7.6	12.264
8	23 44 54.12	2.2120	2 51 23.1	12.251
9	23 47 6.87	2.2131	3 3 37.7	12.235
10	23 49 19.69	2.2142	3 15 51.3	12.219
11	23 51 32.58	2.2154	3 28 3.9	12.202
12	23 53 45.54	2.2166	3 40 15.5	12.184
13	23 55 58.57	2.2179	3 52 26.0	12.164
14	23 58 11.68	2.2192	4 4 35.2	12.142
15	0 0 24.87	2.2205	4 16 43.0	12.119
16	0 2 38.14	2.2219	4 28 49.4	12.095
17	0 4 51.50	2.2234	4 40 54.4	12.071
18	0 7 4.95	2.2249	4 52 57.9	12.045
19	0 9 18.49	2.2264	5 4 59.8	12.018
20	0 11 32.12	2.2279	5 17 0.1	11.990
21	0 13 45.84	2.2295	5 28 58.6	11.960
22	0 15 59.66	2.2312	5 40 55.3	11.930
23	0 18 13.59	2.2330	N. 5 52 50.2	11.898

MONDAY 18.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	0 20 27.62	2.2347	N. 6 4 43.1	11.865
1	0 22 41.75	2.2365	6 16 34.0	11.831
2	0 24 56.00	2.2384	6 28 22.8	11.795
3	0 27 10.36	2.2403	6 40 9.4	11.758
4	0 29 24.84	2.2422	6 51 53.8	11.721
5	0 31 39.43	2.2442	7 3 35.9	11.682
6	0 33 54.14	2.2462	7 15 15.7	11.642
7	0 36 8.98	2.2483	7 26 53.0	11.601
8	0 38 23.94	2.2503	7 38 27.8	11.558
9	0 40 39.02	2.2524	7 50 0.0	11.514
10	0 42 54.23	2.2546	8 1 29.5	11.468
11	0 45 9.57	2.2568	8 12 56.2	11.422
12	0 47 25.05	2.2591	8 24 20.1	11.375
13	0 49 40.66	2.2614	8 35 41.2	11.327
14	0 51 56.41	2.2637	8 46 59.4	11.277
15	0 54 12.30	2.2660	8 58 14.5	11.226
16	0 56 28.33	2.2684	9 9 26.5	11.174
17	0 58 44.51	2.2708	9 20 35.4	11.121
18	1 1 0.83	2.2732	9 31 41.0	11.066
19	1 3 17.30	2.2757	9 42 43.3	11.010
20	1 5 33.92	2.2782	9 53 42.2	10.953
21	1 7 50.68	2.2807	10 4 37.7	10.896
22	1 10 7.60	2.2832	10 15 29.7	10.837
23	1 12 24.67	2.2858	10 26 18.1	10.776
24	1 14 41.90	2.2885	N.10 37 2.8	10.714

TUESDAY 19.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	1 14 41.90	2.2885	N.10 37 2.8	10.714
1	1 16 59.29	2.2911	10 47 43.8	10.652
2	1 19 16.83	2.2937	10 58 21.0	10.588
3	1 21 34.53	2.2963	11 8 54.3	10.523
4	1 23 52.39	2.2990	11 19 23.7	10.456
5	1 26 10.41	2.3017	11 29 49.0	10.387
6	1 28 28.60	2.3045	11 40 10.2	10.318
7	1 30 46.95	2.3072	11 50 27.2	10.249
8	1 33 5.47	2.3100	12 0 40.1	10.179
9	1 35 24.15	2.3128	12 10 48.7	10.107
10	1 37 43.00	2.3156	12 20 52.9	10.033
11	1 40 2.02	2.3183	12 30 52.7	9.959
12	1 42 21.20	2.3211	12 40 48.0	9.883
13	1 44 40.55	2.3239	12 50 38.7	9.807
14	1 47 0.07	2.3267	13 0 24.8	9.729
15	1 49 19.76	2.3296	13 10 6.2	9.650
16	1 51 39.62	2.3324	13 19 42.8	9.569
17	1 53 59.65	2.3352	13 29 14.5	9.488
18	1 56 19.85	2.3381	13 38 41.3	9.406
19	1 58 40.22	2.3409	13 48 3.2	9.322
20	2 1 0.76	2.3437	13 57 20.0	9.237
21	2 3 21.47	2.3466	14 6 31.7	9.152
22	2 5 42.35	2.3404	14 15 38.2	9.065
23	2 8 3.40	2.3523	N.14 24 39.5	8.977

WEDNESDAY 20.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	2 10 24.62	2.3551	N.14 33 35.5	8.888
1	2 12 46.01	2.3578	14 42 26.1	8.798
2	2 15 7.56	2.3606	14 51 11.3	8.707
3	2 17 29.28	2.3634	14 59 51.0	8.615
4	2 19 51.17	2.3662	15 8 25.1	8.522
5	2 22 13.23	2.3690	15 16 53.7	8.429
6	2 24 35.45	2.3717	15 25 16.6	8.333
7	2 26 57.83	2.3744	15 33 33.7	8.237
8	2 29 20.38	2.3771	15 41 45.0	8.140
9	2 31 43.09	2.3798	15 49 50.5	8.042
10	2 34 5.96	2.3825	15 57 50.0	7.942
11	2 36 28.99	2.3852	16 5 43.5	7.842
12	2 38 52.18	2.3878	16 13 31.0	7.741
13	2 41 15.52	2.3903	16 21 12.4	7.638
14	2 43 39.02	2.3929	16 28 47.6	7.535
15	2 46 2.67	2.3954	16 36 16.6	7.432
16	2 48 26.47	2.3979	16 43 39.4	7.327
17	2 50 50.42	2.4003	16 50 55.9	7.222
18	2 53 14.51	2.4028	16 58 6.0	7.115
19	2 55 38.75	2.4052	17 5 9.7	7.007
20	2 58 3.13	2.4075	17 12 6.9	6.898
21	3 0 27.65	2.4098	17 18 57.5	6.789
22	3 2 52.31	2.4121	17 25 41.6	6.679
23	3 5 17.10	2.4143	17 32 19.0	6.568
24	3 7 42.02	2.4164	N.17 38 49.8	6.457

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 21.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	3 7 42.02	2.4164	N.17 38 49.8	6.457
1	3 10 7,07	2.4186	17 45 13.9	6.344
2	3 12 32.25	2.4207	17 51 31.1	6.230
3	3 14 57.55	2.4227	17 57 41.5	6.117
4	3 17 22.97	2.4247	18 3 45.1	6.003
5	3 19 48.51	2.4267	18 9 41.8	5.887
6	3 22 14.17	2.4285	18 15 31.5	5.770
7	3 24 39.93	2.4303	18 21 14.2	5.653
8	3 27 5.80	2.4321	18 26 49.9	5.536
9	3 29 31.78	2.4338	18 32 18.5	5.417
10	3 31 57.86	2.4354	18 37 40.0	5.298
11	3 34 24.03	2.4370	18 42 54.3	5.179
12	3 36 50.30	2.4386	18 48 1.5	5.060
13	3 39 16.66	2.4400	18 53 1.5	4.939
14	3 41 43.10	2.4413	18 57 54.2	4.817
15	3 44 9.62	2.4426	19 2 39.5	4.694
16	3 46 36.22	2.4439	19 7 17.5	4.572
17	3 49 2.89	2.4452	19 11 48.2	4.450
18	3 51 29.64	2.4463	19 16 11.5	4.327
19	3 53 56.45	2.4473	19 20 27.4	4.203
20	3 56 23.32	2.4483	19 24 35.8	4.078
21	3 58 50.24	2.4492	19 28 36.8	3.954
22	4 1 17.22	2.4500	19 32 30.3	3.829
23	4 3 44.24	2.4508	N.19 36 16.3	3.703

FRIDAY 22.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	4 6 11.31	2.4515	N.19 39 54.7	3.577
1	4 8 38.42	2.4521	19 43 25.5	3.451
2	4 11 5.56	2.4526	19 46 48.8	3.325
3	4 13 32.73	2.4530	19 50 4.5	3.198
4	4 15 59.92	2.4533	19 53 12.5	3.070
5	4 18 27.13	2.4536	19 56 12.9	2.943
6	4 20 54.36	2.4539	19 59 5.7	2.816
7	4 23 21.60	2.4540	20 1 50.8	2.688
8	4 25 48.84	2.4540	20 4 28.2	2.560
9	4 28 16.08	2.4539	20 6 58.0	2.432
10	4 30 43.31	2.4538	20 9 20.0	2.303
11	4 33 10.54	2.4537	20 11 34.3	2.174
12	4 35 37.75	2.4534	20 13 40.9	2.046
13	4 38 4.94	2.4530	20 15 39.8	1.917
14	4 40 32.11	2.4525	20 17 30.9	1.787
15	4 42 59.24	2.4519	20 19 14.3	1.658
16	4 45 26.34	2.4513	20 20 49.9	1.530
17	4 47 53.40	2.4506	20 22 17.9	1.402
18	4 50 20.41	2.4497	20 23 38.2	1.273
19	4 52 47.37	2.4488	20 24 50.7	1.144
20	4 55 14.27	2.4478	20 25 55.5	1.015
21	4 57 41.11	2.4468	20 26 52.5	0.886
22	5 0 7.89	2.4457	20 27 41.8	0.758
23	5 2 34.60	2.4445	20 28 23.5	0.631
24	5 5 1.23	2.4431	N.20 28 57.5	0.503

SATURDAY 23.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	5 5 1.23	2.4431	N.20 28 57.5	0.503
1	5 7 27.77	2.4417	20 29 23.8	0.374
2	5 9 54.23	2.4402	20 29 42.4	0.246
3	5 12 20.60	2.4387	20 29 53.3	+ 0.118
4	5 14 46.87	2.4370	20 29 56.6	− 0.009
5	5 17 13.04	2.4352	20 29 52.3	0.136
6	5 19 39.10	2.4334	20 29 40.3	0.263
7	5 22 5.05	2.4315	20 29 20.7	0.389
8	5 24 30.88	2.4295	20 28 53.6	0.514
9	5 26 56.59	2.4274	20 28 19.0	0.640
10	5 29 22.17	2.4252	20 27 36.9	0.766
11	5 31 47.62	2.4230	20 26 47.1	0.892
12	5 34 12.93	2.4207	20 25 49.8	1.017
13	5 36 38.10	2.4183	20 24 45.1	1.140
14	5 39 3.12	2.4158	20 23 33.0	1.263
15	5 41 27.99	2.4133	20 22 13.5	1.386
16	5 43 52.71	2.4107	20 20 46.6	1.509
17	5 46 17.27	2.4080	20 19 12.4	1.632
18	5 48 41.67	2.4052	20 17 30.8	1.754
19	5 51 5.90	2.4023	20 15 41.9	1.875
20	5 53 29.95	2.3993	20 13 45.8	1.995
21	5 55 53.82	2.3963	20 11 42.5	2.115
22	5 58 17.51	2.3933	20 9 32.0	2.234
23	6 0 41.01	2.3902	N.20 7 14.4	2.353

SUNDAY 24.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	6 3 4.33	2.3870	N.20 4 49.6	2.471
1	6 5 27.45	2.3837	20 2 17.8	2.588
2	6 7 50.37	2.3803	19 59 39.0	2.705
3	6 10 13.09	2.3770	19 56 53.2	2.822
4	6 12 35.61	2.3735	19 54 0.4	2.938
5	6 14 57.91	2.3699	19 51 0.6	3.053
6	6 17 20.00	2.3663	19 47 54.0	3.167
7	6 19 41.87	2.3627	19 44 40.6	3.280
8	6 22 3.52	2.3590	19 41 20.4	3.392
9	6 24 24.95	2.3552	19 37 53.5	3.504
10	6 26 46.15	2.3514	19 34 19.9	3.615
11	6 29 7.12	2.3475	19 30 39.7	3.726
12	6 31 27.85	2.3436	19 26 52.8	3.836
13	6 33 48.35	2.3397	19 22 59.4	3.944
14	6 36 8.61	2.3356	19 18 59.5	4.052
15	6 38 28.62	2.3315	19 14 53.2	4.158
16	6 40 48.39	2.3274	19 10 40.5	4.264
17	6 43 7.91	2.3232	19 6 21.5	4.370
18	6 45 27.18	2.3190	19 1 56.1	4.475
19	6 47 46.19	2.3147	18 57 24.5	4.578
20	6 50 4.95	2.3105	18 52 46.7	4.681
21	6 52 23.45	2.3062	18 48 2.8	4.783
22	6 54 41.69	2.3018	18 43 12.8	4.884
23	6 56 59.67	2.2974	18 38 16.7	4.984
24	6 59 17.38	2.2929	N.18 33 14.7	5.083

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 25.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	6 59 17.38	2.2929	N.18 33 14.7	5.083
1	7 1 34.82	2.2884	18 28 6.8	5.181
2	7 3 51.99	2.2840	18 22 53.0	5.278
3	7 6 8.90	2.2795	18 17 33.4	5.374
4	7 8 25.53	2.2749	18 12 8.1	5.470
5	7 10 41.89	2.2703	18 6 37.0	5.565
6	7 12 57.97	2.2657	18 1 0.3	5.658
7	7 15 13.77	2.2610	17 55 18.0	5.751
8	7 17 29.29	2.2564	17 49 30.2	5.842
9	7 19 44.54	2.2518	17 43 37.0	5.932
10	7 21 59.51	2.2471	17 37 38.3	6.022
11	7 24 14.19	2.2423	17 31 34.3	6.111
12	7 26 28.58	2.2375	17 25 25.0	6.199
13	7 28 42.69	2.2328	17 19 10.4	6.286
14	7 30 56.52	2.2281	17 12 50.7	6.371
15	7 33 10.06	2.2233	17 6 25.9	6.455
16	7 35 23.32	2.2186	16 59 56.1	6.539
17	7 37 36.29	2.2137	16 53 21.2	6.622
18	7 39 48.97	2.2089	16 46 41.4	6.704
19	7 42 1.36	2.2042	16 39 56.7	6.785
20	7 44 13.47	2.1994	16 33 7.2	6.865
21	7 46 25.29	2.1946	16 26 12.9	6.944
22	7 48 36.82	2.1897	16 19 13.9	7.022
23	7 50 48.06	2.1849	N.16 12 10.3	7.098

TUESDAY 26.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	7 52 59.01	2.1801	N.16 5 2.2	7.174
1	7 55 9.67	2.1753	15 57 49.5	7.249
2	7 57 20.05	2.1706	15 50 32.3	7.322
3	7 59 30.14	2.1657	15 43 10.8	7.395
4	8 1 39.94	2.1609	15 35 44.9	7.467
5	8 3 49.45	2.1562	15 28 14.7	7.538
6	8 5 58.68	2.1514	15 20 40.3	7.608
7	8 8 7.62	2.1467	15 13 1.8	7.677
8	8 10 16.28	2.1419	15 5 19.1	7.745
9	8 12 24.65	2.1372	14 57 32.4	7.812
10	8 14 32.74	2.1325	14 49 41.7	7.878
11	8 16 40.55	2.1277	14 41 47.1	7.943
12	8 18 48.07	2.1230	14 33 48.6	8.007
13	8 20 55.31	2.1183	14 25 46.3	8.069
14	8 23 2.27	2.1137	14 17 40.3	8.131
15	8 25 8.96	2.1091	14 9 30.6	8.192
16	8 27 15.37	2.1045	14 1 17.3	8.252
17	8 29 21.50	2.0999	13 53 0.3	8.312
18	8 31 27.35	2.0953	13 44 39.8	8.370
19	8 33 32.93	2.0908	13 36 15.9	8.427
20	8 35 38.24	2.0862	13 27 48.5	8.484
21	8 37 43.27	2.0816	13 19 17.8	8.539
22	8 39 48.03	2.0772	13 10 43.8	8.593
23	8 41 52.53	2.0728	13 2 6.6	8.647
24	8 43 56.77	2.0684	N.12 53 26.2	8.699

WEDNESDAY 27.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	8 43 56.77	2.0684	N.12 53 26.2	8.699
1	8 46 0.74	2.0640	12 44 42.7	8.751
2	8 48 4.45	2.0597	12 35 56.1	8.802
3	8 50 7.90	2.0553	12 27 6.5	8.852
4	8 52 11.09	2.0510	12 18 13.9	8.901
5	8 54 14.02	2.0467	12 9 18.4	8.949
6	8 56 16.69	2.0424	12 0 20.0	8.997
7	8 58 19.11	2.0382	11 51 18.8	9.043
8	9 0 21.28	2.0341	11 42 14.9	9.088
9	9 2 23.20	2.0300	11 33 8.3	9.133
10	9 4 24.88	2.0259	11 23 59.0	9.176
11	9 6 26.31	2.0218	11 14 47.2	9.219
12	9 8 27.50	2.0178	11 5 32.8	9.261
13	9 10 28.45	2.0138	10 56 15.9	9.302
14	9 12 29.16	2.0099	10 46 56.6	9.342
15	9 14 29.64	2.0060	10 37 34.9	9.381
16	9 16 29.88	2.0021	10 28 10.9	9.419
17	9 18 29.89	1.9983	10 18 44.6	9.456
18	9 20 29.68	1.9946	10 9 16.1	9.493
19	9 22 29.24	1.9908	9 59 45.4	9.530
20	9 24 28.58	1.9871	9 50 12.5	9.566
21	9 26 27.69	1.9834	9 40 37.5	9.600
22	9 28 26.59	1.9798	9 31 0.5	9.633
23	9 30 25.27	1.9762	N. 9 21 21.5	9.666

THURSDAY 28.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	9 32 23.74	1.9727	N. 9 11 40.6	9.697
1	9 34 22.00	1.9692	9 1 57.8	9.728
2	9 36 20.05	1.9658	8 52 13.2	9.759
3	9 38 17.90	1.9624	8 42 26.7	9.789
4	9 40 15.54	1.9591	8 32 38.5	9.818
5	9 42 12.99	1.9558	8 22 48.6	9.846
6	9 44 10.24	1.9525	8 12 57.0	9.873
7	9 46 7.29	1.9493	8 3 3.8	9.899
8	9 48 4.16	1.9462	7 53 9.1	9.925
9	9 50 0.84	1.9432	7 43 12.8	9.950
10	9 51 57.34	1.9401	7 33 15.1	9.974
11	9 53 53.65	1.9370	7 23 15.9	9.998
12	9 55 49.78	1.9341	7 13 15.3	10.021
13	9 57 45.74	1.9312	7 3 13.4	10.043
14	9 59 41.52	1.9283	6 53 10.2	10.064
15	10 1 37.13	1.9255	6 43 5.7	10.085
16	10 3 32.58	1.9227	6 33 0.0	10.105
17	10 5 27.86	1.9200	6 22 53.1	10.125
18	10 7 22.98	1.9174	6 12 45.0	10.144
19	10 9 17.95	1.9148	6 2 35.8	10.162
20	10 11 12.76	1.9122	5 52 25.6	10.178
21	10 13 7.41	1.9096	5 42 14.4	10.194
22	10 15 1.91	1.9072	5 32 2.3	10.210
23	10 16 56.27	1.9048	5 21 49.2	10.226
24	10 18 50.49	1.9025	N. 5 11 35.2	10.241

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	10 18 50.49	1.9025	N. 5 11 35.2	10.241
1	10 20 44.57	1.9002	5 1 20.3	10.255
2	10 22 38.51	1.8979	4 51 4.6	10.267
3	10 24 32.32	1.8957	4 40 48.2	10.279
4	10 26 26.00	1.8936	4 30 31.1	10.291
5	10 28 19.55	1.8915	4 20 13.3	10.303
6	10 30 12.98	1.8895	4 9 54.8	10.314
7	10 32 6.29	1.8875	3 59 35.6	10.324
8	10 33 59.48	1.8856	3 49 15.9	10.333
9	10 35 52.56	1.8837	3 38 55.7	10.341
10	10 37 45.53	1.8819	3 28 35.0	10.349
11	10 39 38.39	1.8802	3 18 13.8	10.357
12	10 41 31.15	1.8785	3 7 52.1	10.365
13	10 43 23.81	1.8768	2 57 30.0	10.371
14	10 45 16.37	1.8752	2 47 7.6	10.376
15	10 47 8.83	1.8736	2 36 44.9	10.381
16	10 49 1.20	1.8721	2 26 21.9	10.385
17	10 50 53.49	1.8707	2 15 58.7	10.389
18	10 52 45.69	1.8693	2 5 35.2	10.392
19	10 54 37.81	1.8680	1 55 11.6	10.395
20	10 56 29.85	1.8668	1 44 47.8	10.397
21	10 58 21.82	1.8656	1 34 23.9	10.399
22	11 0 13.72	1.8644	1 23 59.9	10.400
23	11 2 5.55	1.8632	N. 1 13 35.9	10.400

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	11 3 57.31	1.8622	N. 1 3 11.9	10.400
1	11 5 49.01	1.8612	0 52 47.9	10.399
2	11 7 40.66	1.8603	0 42 24.0	10.397
3	11 9 32.25	1.8594	0 32 0.2	10.395
4	11 11 23.79	1.8586	0 21 36.6	10.393
5	11 13 15.28	1.8579	0 11 13.1	10.390
6	11 15 6.73	1.8572	N. 0 0 49.8	10.387
7	11 16 58.14	1.8565	S. 0 9 33.3	10.382
8	11 18 49.51	1.8558	0 19 56.1	10.377
9	11 20 40.84	1.8552	0 30 18.6	10.372
10	11 22 32.14	1.8547	0 40 40.7	10.366
11	11 24 23.41	1.8543	0 51 2.5	10.360
12	11 26 14.66	1.8540	1 1 23.9	10.353
13	11 28 5.89	1.8537	1 11 44.8	10.345
14	11 29 57.10	1.8534	1 22 5.3	10.337
15	11 31 48.29	1.8532	1 32 25.3	10.329
16	11 33 39.48	1.8531	1 42 44.8	10.320
17	11 35 30.66	1.8529	1 53 3.7	10.310
18	11 37 21.83	1.8528	2 3 22.0	10.300
19	11 39 13.00	1.8529	2 13 39.7	10.289
20	11 41 4.18	1.8530	2 23 56.7	10.278
21	11 42 55.36	1.8531	2 34 13.0	10.266
22	11 44 46.55	1.8532	2 44 28.6	10.253
23	11 46 37.75	1.8535	2 54 43.4	10.240
24	11 48 28.97	1.8538	S. 3 4 57.4	10.226

SUNDAY 31.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
	h m s	s	° ′ ″	″
0	11 48 28.97	1.8538	S. 3 4 57.4	10.226
1	11 50 20.21	1.8542	3 15 10.6	10.212
2	11 52 11.47	1.8545	3 25 22.9	10.198
3	11 54 2.75	1.8549	3 35 34.4	10.184
4	11 55 54.06	1.8554	3 45 45.0	10.168
5	11 57 45.40	1.8560	3 55 54.6	10.152
6	11 59 36.78	1.8567	4 6 3.2	10.135
7	12 1 28.20	1.8573	4 16 10.8	10.117
8	12 3 19.66	1.8580	4 26 17.3	10.100
9	12 5 11.16	1.8588	4 36 22.8	10.082
10	12 7 2.71	1.8596	4 46 27.2	10.063
11	12 8 54.31	1.8605	4 56 30.4	10.043
12	12 10 45.97	1.8615	5 6 32.4	10.023
13	12 12 37.69	1.8625	5 16 33.2	10.003
14	12 14 29.47	1.8635	5 26 32.8	9.982
15	12 16 21.31	1.8646	5 36 31.1	9.961
16	12 18 13.22	1.8657	5 46 28.1	9.939
17	12 20 5.20	1.8669	5 56 23.8	9.917
18	12 21 57.25	1.8682	6 6 18.1	9.893
19	12 23 49.38	1.8695	6 16 11.0	9.869
20	12 25 41.59	1.8709	6 26 2.4	9.845
21	12 27 33.89	1.8723	6 35 52.4	9.821
22	12 29 26.27	1.8738	6 45 40.9	9.795
23	12 31 18.75	1.8754	S. 6 55 27.8	9.768

MONDAY, JANUARY 1, 1883.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
0	12 33 11.32	1.8769	S. 7 5 13.1	9.742

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter. . . .	2	2	56.4
● New Moon	10	3	37.6
☽ First Quarter . . .	17	4	39.6
○ Full Moon	24	3	41.4

	d	h
☾ Apogee.	3	13.2
☾ Perigee.	18	8.0
☾ Apogee.	31	10.6

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Aldebaran	W.	78° 19′ 26″	3001	79° 49′ 37″	3010	81° 19′ 37″	3018	82° 49′ 27″	3026
	Jupiter	W.	58 26 27	2955	59 57 36	2963	61 28 35	2971	62 59 24	2979
	Pollux	W.	37 10 42	3224	38 36 23	3218	40 2 11	3213	41 28 5	3209
	Spica	E.	55 16 34	2991	53 46 10	3001	52 15 58	3009	50 45 56	3017
	Sun	E.	102 17 35	3373	100 54 48	3384	99 32 13	3393	98 9 48	3400
2	Aldebaran	W.	90 16 22	3058	91 45 23	3064	93 14 17	3068	94 43 6	3072
	Jupiter	W.	70 31 17	3009	72 1 18	3014	73 31 13	3019	75 1 2	3022
	Pollux	W.	48 38 28	3198	50 4 40	3197	51 30 53	3195	52 57 8	3194
	Spica	E.	43 18 2	3049	41 48 50	3054	40 19 44	3059	38 50 44	3062
	Sun	E.	91 19 57	3437	89 58 22	3442	88 36 53	3447	87 15 30	3452
3	Jupiter	W.	82 29 10	3034	83 58 41	3035	85 28 10	3036	86 57 38	3035
	Pollux	W.	60 8 45	3186	61 35 11	3184	63 1 39	3182	64 28 10	3180
	Regulus	W.	23 7 32	3209	24 33 31	3196	25 59 45	3184	27 26 13	3173
	Spica	E.	31 26 43	3075	29 58 3	3076	28 29 24	3077	27 0 46	3077
	Sun	E.	80 29 37	3466	79 8 35	3467	77 47 34	3468	76 26 34	3468
4	Pollux	W.	71 41 34	3163	73 8 28	3158	74 35 27	3153	76 2 32	3149
	Regulus	W.	34 41 18	3133	36 8 47	3127	37 36 24	3119	39 4 10	3112
	Sun	E.	69 41 23	3461	68 20 15	3458	66 59 4	3454	65 37 49	3451
5	Pollux	W.	83 19 28	3120	84 47 13	3114	86 15 6	3107	87 43 7	3101
	Regulus	W.	46 25 15	3074	47 53 56	3067	49 22 46	3059	50 51 46	3050
	Sun	E.	58 50 19	3425	57 28 31	3418	56 6 35	3411	54 44 31	3404
6	Pollux	W.	95 5 26	3061	96 34 23	3052	98 3 31	3044	99 32 49	3036
	Regulus	W.	58 19 29	3005	59 49 36	2995	61 19 55	2985	62 50 26	2975
	Sun	E.	47 52 0	3362	46 29 0	3353	45 5 50	3344	43 42 29	3334
7	Regulus	W.	70 26 18	2922	71 58 9	2911	73 30 14	2900	75 2 33	2888
	Spica	W.	16 26 45	2900	17 59 4	2889	19 31 37	2878	21 4 24	2866
	Sun	E.	36 42 50	3282	35 18 18	3271	33 53 33	3261	32 28 36	3250
8	Regulus	W.	82 47 50	2831	84 21 38	2819	85 55 41	2808	87 29 59	2795
	Spica	W.	28 51 59	2809	30 26 15	2798	32 0 45	2787	33 35 30	2775
	Sun	E.	25 20 39	3197	23 54 26	3188	22 28 2	3178	21 1 27	3170
12	Sun	W.	23 9 17	2838	24 42 56	2827	26 16 49	2816	27 50 56	2806
	Fomalhaut	E.	54 14 52	3253	52 49 46	3283	51 25 15	3316	50 1 22	3352
	α Pegasi	E.	68 29 23	2651	66 51 37	2648	65 13 47	2645	63 35 53	2643
13	Sun	W.	35 44 30	2764	37 19 45	2757	38 55 9	2750	40 30 43	2744
	Fomalhaut	E.	43 14 23	3624	41 56 15	3703	40 39 31	3792	39 24 21	3894
	α Pegasi	E.	55 26 14	2649	53 48 25	2652	52 10 41	2658	50 33 5	2666
	α Arietis	E.	98 7 48	2470	96 25 52	2463	94 43 47	2457	93 1 33	2451
14	Sun	W.	48 30 37	2713	50 6 59	2709	51 43 27	2704	53 20 2	2698
	α Pegasi	E.	42 28 19	2732	40 52 21	2753	39 16 51	2777	37 41 53	2807
	α Arietis	E.	84 28 29	2427	82 45 32	2422	81 2 29	2418	79 19 20	2415
15	Sun	W.	61 24 30	2678	63 1 40	2674	64 38 55	2670	66 16 15	2666
	α Aquilæ	W.	33 31 29	4044	34 42 25	3894	35 55 51	3763	37 11 32	3649

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Aldebaran	W.	84° 19′ 7″	3034	85° 48′ 37″	3041	87° 17′ 59″	3047	88° 47′ 14″	3052
	JUPITER	W.	64 30 3	2986	66 0 33	2993	67 30 55	2999	69 1 9	3004
	Pollux	W.	42 54 4	3206	44 20 6	3204	45 46 11	3202	47 12 18	3199
	Spica	E.	49 16 4	3024	47 46 21	3031	46 16 47	3038	44 47 21	3043
	SUN	E.	96 47 32	3408	95 25 25	3416	94 3 27	3424	92 41 38	2431
2	Aldebaran	W.	96 11 50	3075	97 40 30	3078	99 9 6	3082	100 37 38	3084
	JUPITER	W.	76 30 47	3026	78 0 27	3029	79 30 4	3031	80 59 38	3033
	Pollux	W.	54 23 24	3193	55 49 42	3192	57 16 1	3190	58 42 22	3188
	Spica	E.	37 21 48	3065	35 52 56	3069	34 24 8	3072	32 55 24	3074
	SUN	E.	85 54 12	3455	84 32 58	3459	83 11 48	3462	81 50 41	3464
3	JUPITER	W.	88 27 7	3035	89 56 36	3034	91 26 7	3033	92 55 39	3031
	Pollux	W.	65 54 43	3178	67 21 19	3174	68 47 59	3170	70 14 44	3166
	Regulus	W.	28 52 54	3164	30 19 46	3157	31 46 47	3148	33 13 58	3141
	Spica	E.	25 32 8	3077	24 3 30	3076	22 34 51	3074	21 6 10	3073
	SUN	E.	75 5 34	3467	73 44 33	3466	72 23 31	3465	71 2 28	3463
4	Pollux	W.	77 29 42	3144	78 56 58	3138	80 24 21	3133	81 51 51	3127
	Regulus	W.	40 32 5	3105	42 0 9	3097	43 28 22	3090	44 56 44	3082
	SUN	E.	64 16 30	3446	62 55 6	3441	61 33 36	3437	60 12 1	3431
5	Pollux	W.	89 11 16	3093	90 39 34	3085	92 8 2	3078	93 36 39	3069
	Regulus	W.	52 20 57	3041	53 50 19	3033	55 19 51	3024	56 49 34	3014
	SUN	E.	53 22 19	3396	51 59 58	3388	50 37 28	3380	49 14 49	3372
6	Pollux	W.	101 2 17	3027	102 31 56	3018	104 1 46	3009	105 31 47	3001
	Regulus	W.	64 21 10	2965	65 52 7	2954	67 23 17	2943	68 54 41	2933
	SUN	E.	42 18 57	3324	40 55 13	3313	39 31 17	3304	38 7 10	3293
7	Regulus	W.	76 35 7	2876	78 7 56	2866	79 40 59	2854	81 14 17	2842
	Spica	W.	22 37 26	2855	24 10 42	2844	25 44 13	2832	27 17 59	2821
	SUN	E.	31 3 26	3239	29 38 3	3229	28 12 28	3218	26 46 40	3207
8	Regulus	W.	89 4 33	2784	90 39 22	2772	92 14 26	2760	93 49 46	2749
	Spica	W.	35 10 31	2763	36 45 47	2751	38 21 19	2740	39 57 6	2729
	SUN	E.	19 34 42	3163	18 7 48	3156	16 40 47	3153	15 13 41	3150
12	SUN	W.	29 25 16	2797	30 59 48	2788	32 34 31	2780	34 9 25	2772
	Fomalhaut	E.	48 38 11	3393	47 15 47	3441	45 54 17	3495	44 33 47	3555
	α Pegasi	E.	61 57 57	2643	60 20 0	2643	58 42 3	2643	57 4 7	2646
13	SUN	W.	42 6 25	2737	43 42 16	2731	45 18 15	2725	46 54 22	2719
	Fomalhaut	E.	38 10 55	4010	36 59 25	4142	35 50 4	4294	34 43 6	4471
	α Pegasi	E.	48 55 39	2675	47 18 25	2685	45 41 25	2698	44 4 42	2713
	α Arietis	E.	91 19 11	2446	89 36 41	2441	87 54 4	2436	86 11 20	2431
14	SUN	W.	54 56 44	2694	56 33 32	2689	58 10 26	2686	59 47 25	2681
	α Pegasi	E.	36 7 34	2842	34 34 0	2882	33 1 18	2931	31 29 38	2988
	α Arietis	E.	77 36 6	2411	75 52 47	2408	74 9 24	2405	72 25 56	2403
15	SUN	W.	67 53 40	2663	69 31 9	2660	71 8 43	2657	72 46 21	2655
	α Aquilæ	W.	38 29 14	3546	39 48 47	3455	41 10 1	3376	42 32 45	3305

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh	P. L. of Diff.
15	α Arietis	E.	70° 42′ 25″	2401	68° 58′ 51″	2398	67° 15′ 14″	2396	65° 31′ 34″	2395
	Saturn	E.	85 54 42	2328	84 9 24	2325	82 24 1	2322	80 33 33	2319
	Aldebaran	E.	103 48 5	2354	102 3 24	2350	100 18 38	2347	98 33 47	2344
16	Sun	W.	74 24 2	2652	76 1 47	2649	77 39 35	2646	79 17 27	2644
	α Aquilæ	W.	43 56 51	3241	45 22 12	3184	46 48 40	3133	48 16 10	3087
	α Arietis	E.	56 52 53	2393	55 9 8	2394	53 25 24	2395	51 41 42	2396
	Saturn	E.	71 50 13	2306	70 4 22	2303	68 18 27	2301	66 32 29	2299
	Aldebaran	E.	89 48 26	2330	88 3 10	2327	86 17 50	2325	84 32 27	2323
	Jupiter	E.	107 43 50	2284	105 57 27	2281	104 11 0	2279	102 24 29	2276
17	Sun	W.	87 27 33	2635	89 5 41	2632	90 43 52	2630	92 22 6	2629
	α Aquilæ	W.	55 46 8	2915	57 18 8	2889	58 50 41	2866	60 23 44	2845
	α Arietis	E.	43 4 6	2416	41 20 54	2422	39 37 50	2429	37 54 57	2439
	Saturn	E.	57 41 57	2290	55 55 43	2289	54 9 28	2288	52 23 11	2286
	Aldebaran	E.	75 44 48	2314	73 59 9	2312	72 13 27	2311	70 27 43	2310
	Jupiter	E.	93 31 7	2266	91 44 18	2265	89 57 27	2264	88 10 34	2262
18	Sun	W.	100 33 38	2624	102 12 0	2624	103 50 23	2623	105 28 47	2623
	α Aquilæ	W.	68 14 57	2766	69 50 9	2756	71 25 35	2745	73 1 15	2736
	Fomalhaut	W.	42 9 12	3484	43 29 54	3407	44 52 3	3338	46 15 30	3278
	Saturn	E.	43 31 24	2284	41 45 1	2283	39 58 37	2283	38 12 13	2284
	Aldebaran	E.	61 38 45	2307	59 52 55	2306	58 7 4	2306	56 21 13	2306
	Jupiter	E.	79 15 39	2257	77 28 36	2256	75 41 32	2256	73 54 28	2256
19	Sun	W.	113 40 46	2624	115 19 8	2625	116 57 29	2626	118 35 48	2627
	Fomalhaut	W.	53 28 24	3055	54 57 29	3022	56 27 14	2994	57 57 34	2968
	α Pegasi	W.	33 19 37	2810	34 53 52	2766	36 29 4	2729	38 5 5	2697
	Aldebaran	E.	47 32 8	2311	45 46 24	2312	44 0 42	2314	42 15 3	2316
	Jupiter	E.	64 59 2	2256	63 11 58	2257	61 24 55	2258	59 37 54	2259
	Pollux	E.	90 4 5	2375	88 19 55	2376	86 35 46	2378	84 51 39	2380
20	Fomalhaut	W.	65 36 21	2875	67 9 12	2862	68 42 19	2852	70 15 40	2842
	α Pegasi	W.	46 14 13	2591	47 53 21	2577	49 32 48	2565	51 12 31	2556
	Aldebaran	E.	33 27 52	2335	31 42 44	2341	29 57 44	2348	28 12 54	2355
	Jupiter	E.	50 43 17	2268	48 56 31	2270	47 9 48	2274	45 23 10	2277
	Pollux	E.	76 11 46	2391	74 27 59	2395	72 44 17	2399	71 0 41	2403
21	Fomalhaut	W.	78 4 51	2816	79 38 58	2815	81 13 6	2815	82 47 15	2816
	α Pegasi	W.	59 33 49	2527	61 14 25	2524	62 55 5	2522	64 35 47	2522
	Jupiter	E.	36 31 17	2298	34 45 14	2303	32 59 19	2309	31 13 33	2316
	Pollux	E.	62 24 33	2434	60 41 47	2443	58 59 13	2452	57 16 52	2461
	Regulus	E.	98 48 41	2347	97 3 50	2351	95 19 5	2355	93 34 26	2359
22	Fomalhaut	W.	90 37 8	2838	92 10 47	2845	93 44 16	2854	95 17 34	2863
	α Pegasi	W.	72 59 4	2531	74 39 34	2535	76 19 59	2540	78 0 17	2545
	α Arietis	W.	29 22 40	2572	31 2 13	2559	32 42 4	2549	34 22 9	2542
	Pollux	E.	48 48 49	2522	47 8 6	2538	45 27 45	2554	43 47 47	2572
	Regulus	E.	84 53 0	2389	83 9 9	2395	81 25 27	2402	79 41 55	2410
23	α Arietis	W.	42 44 3	2536	44 24 26	2538	46 4 46	2541	47 45 2	2545
	Saturn	W.	27 7 11	2429	28 50 4	2436	30 32 47	2444	32 15 19	2453
	Pollux	E.	35 35 8	2697	33 58 24	2731	32 22 25	2769	30 47 17	2812

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
15	α Arietis	E.	63° 47′ 52″	2394	62° 4′ 8″	2393	60° 20′ 23″	2393	58° 36′ 38″	2393
	SATURN	E.	78 53 1	2316	77 7 25	2313	75 21 45	2311	73 36 1	2308
	Aldebaran	E.	96 48 52	2341	95 3 52	2337	93 18 47	2335	91 33 38	2333
16	SUN	W.	80 55 22	2641	82 33 21	2639	84 11 23	2638	85 49 27	2636
	α Aquilæ	W.	49 44 36	3045	51 13 53	3007	52 43 57	2973	54 14 43	2942
	α Arietis	E.	49 58 2	2398	48 14 25	2402	46 30 53	2405	44 47 26	2410
	SATURN	E.	64 46 28	2297	63 0 24	2296	61 14 18	2294	59 28 9	2291
	Aldebaran	E.	82 47 1	2321	81 1 32	2319	79 16 0	2317	77 30 25	2315
	JUPITER	E.	100 37 54	2274	98 51 16	2272	97 4 36	2270	95 17 53	2268
17	SUN	W.	94 0 22	2628	95 38 39	2627	97 16 57	2626	98 55 17	2625
	α Aquilæ	W.	61 57 14	2826	63 31 8	2808	65 5 25	2793	66 40 2	2779
	α Arietis	E.	36 12 18	2450	34 29 55	2463	32 47 50	2479	31 6 7	2498
	SATURN	E.	50 36 51	2285	48 50 30	2285	47 4 9	2285	45 17 47	2284
	Aldebaran	E.	68 41 58	2309	66 56 12	2308	65 10 24	2307	63 24 35	2307
	JUPITER	E.	86 23 38	2260	84 36 40	2260	82 49 41	2259	81 2 41	2258
18	SUN	W.	107 7 11	2623	108 45 35	2623	110 23 59	2623	112 2 23	2624
	α Aquilæ	W.	74 37 7	2739	76 13 9	2722	77 49 20	2716	79 25 39	2711
	Fomalhaut	W.	47 40 7	3223	49 5 49	3174	50 32 29	3130	52 0 2	3090
	SATURN	E.	36 25 50	2285	34 39 28	2285	32 53 7	2287	31 6 48	2288
	Aldebaran	E.	54 35 22	2307	52 49 32	2307	51 3 42	2308	49 17 54	2309
	JUPITER	E.	72 7 23	2255	70 20 17	2255	68 33 11	2256	66 46 6	2256
19	SUN	W.	120 14 6	2629	121 52 22	2631	123 30 35	2633	125 8 45	2636
	Fomalhaut	W.	59 28 27	2945	60 59 49	2924	62 31 37	2905	64 3 49	2890
	α Pegasi	W.	39 41 49	2669	41 19 10	2645	42 57 4	2624	44 35 26	2606
	Aldebaran	E.	40 29 27	2320	38 43 56	2322	36 58 29	2326	35 13 7	2331
	JUPITER	E.	57 50 54	2260	56 3 56	2262	54 17 0	2264	52 30 7	2266
	Pollux	E.	83 7 35	2381	81 23 33	2383	79 39 34	2385	77 55 38	2388
20	Fomalhaut	W.	71 49 14	2834	73 22 58	2828	74 56 50	2823	76 30 48	2819
	α Pegasi	W.	52 52 27	2547	54 32 35	2540	56 12 52	2535	57 53 17	2530
	Aldedaran	E.	26 28 15	2364	24 43 49	2375	22 59 39	2388	21 15 47	2404
	JUPITER	E.	43 36 36	2280	41 50 7	2284	40 3 44	2288	38 17 27	2293
	Pollux	E.	69 17 11	2408	67 33 48	2415	65 50 34	2421	64 7 29	2427
21	Fomalhaut	W.	84 21 22	2818	85 55 26	2821	87 29 26	2825	89 3 21	2831
	α Pegasi	W.	66 16 29	2522	67 57 11	2523	69 37 52	2525	71 18 30	2528
	JUPITER	E.	29 27 57	2323	27 42 31	2331	25 57 17	2339	24 12 15	2349
	Pollux	E.	55 34 44	2472	53 52 51	2482	52 11 13	2494	50 29 52	2507
	Regulus	E.	91 49 53	2364	90 5 27	2370	88 21 9	2376	86 37 0	2382
22	Fomalhaut	W.	96 50 40	2875	98 23 31	2887	99 56 7	2900	101 28 26	2915
	α Pegasi	W.	79 40 28	2551	81 20 31	2557	83 0 25	2564	84 40 10	2572
	α Arietis	W.	36 2 24	2538	37 42 45	2535	39 23 10	2533	41 3 37	2534
	Pollux	E.	42 8 14	2592	40 29 8	2615	38 50 33	2640	37 12 32	2667
	Regulus	E.	77 58 34	2417	76 15 24	2426	74 32 26	2434	72 49 40	2443
23	α Arietis	W.	49 25 12	2551	51 5 14	2558	52 45 7	2565	54 24 50	2572
	SATURN	W.	33 57 39	2462	35 39 46	2471	37 21 40	2481	39 3 20	2490
	Pollux	E.	29 13 5	2862	27 39 57	2920	26 8 3	2987	24 37 34	3066

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	Regulus	E.	71 7 6	2452	69 24 45	2462	67 42 38	2471	66 0 44	2482
24	α Arietis	W.	56 4 23	2580	57 43 46	2588	59 22 57	2598	61 1 55	2607
	Saturn	W.	40 44 47	2500	42 26 0	2511	44 6 58	2522	45 47 40	2534
	Aldebaran	W.	22 35 21	2571	24 14 56	2574	25 54 26	2580	27 33 49	2586
	Regulus	E.	57 35 0	2538	55 54 39	2550	54 14 35	2563	52 34 49	2575
	Spica	E.	111 18 20	2509	109 37 19	2520	107 56 33	2530	106 16 2	2542
25	α Arietis	W.	69 13 23	2660	70 50 57	2671	72 28 16	2682	74 5 20	2695
	Saturn	W.	54 7 13	2593	55 46 18	2604	57 25 7	2617	59 3 39	2630
	Aldebaran	W.	35 48 9	2630	37 26 23	2640	39 4 23	2652	40 42 8	2663
	Jupiter	W.	19 3 59	2600	20 42 54	2607	22 21 40	2614	24 0 16	2623
	Regulus	E.	44 20 33	2646	42 42 40	2661	41 5 8	2677	39 27 57	2693
	Spica	E.	97 57 34	2603	96 18 43	2615	94 40 8	2628	93 1 51	2640
26	α Arietis	W.	82 6 33	2756	83 41 58	2769	85 17 6	2782	86 51 58	2795
	Saturn	W.	67 11 58	2694	68 48 46	2707	70 25 16	2720	72 1 29	2733
	Aldebaran	W.	48 47 1	2722	50 23 12	2735	51 59 6	2747	53 34 44	2760
	Jupiter	W.	32 9 54	2677	33 47 5	2688	35 24 1	2700	37 0 41	2713
	Regulus	E.	31 27 44	2765	29 52 56	2806	28 18 36	2828	26 44 45	2852
	Spica	E.	84 54 46	2705	83 18 13	2719	81 41 58	2732	80 6 0	2744
27	Saturn	W.	79 58 18	2798	81 32 49	2810	83 7 4	2822	84 41 3	2835
	Aldebaran	W.	61 28 47	2821	63 2 47	2833	64 36 32	2845	66 10 1	2858
	Jupiter	W.	44 59 57	2773	46 35 0	2785	48 9 48	2797	49 44 20	2808
	Spica	E.	72 10 28	2809	70 36 12	2821	69 2 12	2834	67 28 28	2846
28	Aldebaran	W.	73 53 37	2915	75 25 37	2926	76 57 23	2936	78 28 56	2946
	Jupiter	W.	57 33 14	2866	59 6 17	2876	60 39 7	2887	62 11 43	2897
	Pollux	W.	32 56 37	3190	34 22 58	3179	35 49 32	3171	37 16 16	3165
	Spica	E.	59 43 42	2905	58 11 29	2916	56 39 30	2927	55 7 45	2937
	Antares	E.	105 9 55	2931	103 38 16	2942	102 6 51	2953	100 35 39	2963
	Sun	E.	134 3 44	3297	132 39 29	3308	131 15 27	3319	129 51 38	3330
29	Aldebaran	W.	86 3 31	2994	87 33 51	3003	89 4 0	3011	90 33 59	3018
	Jupiter	W.	69 51 35	2943	71 22 59	2952	72 54 12	2960	74 25 15	2968
	Pollux	W.	44 31 10	3153	45 58 15	3154	47 25 19	3155	48 52 22	3156
	Spica	E.	47 32 10	2985	46 1 38	2993	44 31 17	3001	43 1 6	3009
	Antares	E.	93 2 45	3009	91 32 44	3018	90 2 54	3027	88 33 15	3035
	Sun	E.	122 55 35	3380	121 32 56	3390	120 10 28	3398	118 48 9	3407
30	Aldebaran	W.	98 1 41	3052	99 30 50	3056	100 59 53	3062	102 28 49	3066
	Jupiter	W.	81 58 14	3001	83 28 26	3005	84 58 32	3010	86 28 32	3014
	Pollux	W.	56 7 17	3163	57 34 11	3163	59 1 4	3165	60 27 55	3166
	Regulus	W.	19 8 16	3225	20 33 55	3206	21 59 57	3192	23 26 16	3180
	Spica	E.	35 32 26	3042	34 3 5	3047	32 33 51	3052	31 4 43	3056
	Antares	E.	81 7 14	3069	79 38 26	3073	78 9 44	3078	76 41 8	3083
	Sun	E.	111 58 47	3441	110 37 17	3447	109 15 54	3453	107 54 37	3457
31	Pollux	W.	67 41 55	3168	69 8 42	3168	70 35 29	3168	72 2 17	3166
	Regulus	W.	30 40 33	3147	32 7 46	3143	33 35 4	3138	35 2 27	3134
	Antares	E.	69 19 25	3101	67 51 16	3103	66 23 10	3105	64 55 6	3105
	Sun	E.	101 9 18	3473	99 48 24	3474	98 27 31	3476	97 6 40	3477

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Regulus	E.	64° 19′ 5″	2492	62° 37′ 41″	2503	60° 56′ 32″	2514	59° 15′ 38″	2525
24	α Arietis	W.	62 40 40	2617	64 19 12	2627	65 57 30	2638	67 35 34	2649
	Saturn	W.	47 28 6	2545	49 8 17	2556	50 48 12	2568	52 27 51	2580
	Aldebaran	W.	29 13 3	2593	30 52 7	2601	32 31 0	2610	34 9 41	2620
	Regulus	E.	50 55 20	2589	49 16 10	2602	47 37 18	2617	45 58 46	2631
	Spica	E.	104 35 47	2554	102 55 49	2566	101 16 7	2578	99 36 42	2591
25	α Arietis	W.	75 42 7	2707	77 18 38	2719	78 54 53	2732	80 30 51	2744
	Saturn	W.	60 41 53	2643	62 19 50	2655	63 57 30	2668	65 34 53	2681
	Aldebaran	W.	42 19 38	2675	43 56 52	2686	45 33 51	2698	47 10 34	2710
	Jupiter	W.	25 38 40	2633	27 16 50	2643	28 54 46	2655	30 32 27	2665
	Regulus	E.	37 51 8	2710	36 14 41	2727	34 38 37	2746	33 2 58	2765
	Spica	E.	91 23 51	2654	89 46 9	2666	88 8 44	2679	86 31 36	2692
26	α Arietis	W.	88 26 32	2808	90 0 49	2821	91 34 49	2834	93 8 33	2847
	Saturn	W.	73 37 25	2746	75 13 4	2760	76 48 25	2772	78 23 30	2785
	Aldebaran	W.	55 10 5	2772	56 45 10	2785	58 19 58	2797	59 54 30	2808
	Jupiter	W.	38 37 4	2724	40 13 12	2737	41 49 3	2749	43 24 38	2761
	Regulus	E.	25 11 25	2879	23 38 39	2909	22 6 31	2942	20 35 5	2980
	Spica	E.	78 30 19	2758	76 54 56	2771	75 19 50	2784	73 45 1	2796
27	Saturn	W.	86 14 46	2846	87 48 14	2859	89 21 26	2871	90 54 22	2883
	Aldebaran	W.	67 43 14	2869	69 16 12	2881	70 48 55	2893	72 21 23	2904
	Jupiter	W.	51 18 37	2820	52 52 39	2832	54 26 25	2843	55 59 57	2855
	Spica	E.	65 55 0	2859	64 21 48	2870	62 48 51	2882	61 16 9	2894
28	Aldebaran	W.	80 0 16	2957	81 31 23	2967	83 2 17	2976	84 33 0	2985
	Jupiter	W.	63 44 6	2907	65 16 16	2916	66 48 14	2926	68 20 0	2935
	Pollux	W.	38 43 7	3160	40 10 4	3158	41 37 4	3156	43 4 6	3154
	Spica	E.	53 36 13	2947	52 4 54	2957	50 33 47	2967	49 2 53	2976
	Antares	E.	99 4 40	2973	97 33 54	2983	96 3 20	2992	94 32 57	3001
	Sun	E.	128 28 1	3341	127 4 37	3351	125 41 25	3361	124 18 24	3371
29	Aldebaran	W.	92 3 49	3026	93 33 29	3033	95 3 1	3039	96 32 25	3046
	Jupiter	W.	75 56 8	2975	77 26 52	2962	78 57 27	2969	80 27 54	2994
	Pollux	W.	50 19 24	3157	51 46 25	3158	53 13 24	3160	54 40 21	3161
	Spica	E.	41 31 4	3017	40 1 12	3024	38 31 29	3030	37 1 54	3036
	Antares	E.	87 3 46	3043	85 34 26	3049	84 5 14	3056	82 36 10	3062
	Sun	E.	117 26 0	3415	116 4 0	3422	114 42 8	3429	113 20 24	3435
30	Aldebaran	W.	103 57 40	3070	105 26 26	3074	106 55 7	3077	108 23 45	3080
	Jupiter	W.	87 58 27	3018	89 28 17	3022	90 58 3	3025	92 27 45	3027
	Pollux	W.	61 54 45	3168	63 21 33	3168	64 48 21	3168	66 15 8	3168
	Regulus	W.	24 52 49	3171	26 19 33	3163	27 46 26	3158	29 13 26	3152
	Spica	E.	29 35 40	3060	28 6 42	3064	26 37 48	3067	25 8 58	3069
	Antares	E.	75 12 38	3087	73 44 13	3091	72 15 53	3095	70 47 37	3098
	Sun	E.	106 33 25	3461	105 12 17	3465	103 51 14	3468	102 30 14	3471
31	Pollux	W.	73 29 7	3165	74 55 58	3163	76 22 51	3161	77 49 47	3158
	Regulus	W.	36 29 55	3130	37 57 28	3126	39 25 6	3122	40 52 49	3117
	Antares	E.	63 27 3	3106	61 59 1	3107	60 31 0	3107	59 2 59	3106
	Sun	E.	95 45 50	3477	94 25 0	3476	93 4 9	3475	91 43 17	3473

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	18 34 51.48	+ 17.589	− 24 47 10.0	+ 3.49	23 53.8
2	18 41 54.26	17.642	24 45 3.4	7.08	23 56.9
3	18 48 58.25	17.690	24 41 30.0	10.72	
4	18 56 3.33	17.732	24 36 28.8	14.39	0 0.1
5	19 3 9.36	17.770	24 29 59.0	18.10	0 3.2
6	19 10 16.23	+ 17.802	− 24 21 59.6	+ 21.86	0 6.4
7	19 17 23.83	17.829	24 12 29.5	25.66	0 9.6
8	19 24 32.01	17.851	24 1 37.9	29.48	0 12.8
9	19 31 40.62	17.866	23 48 54.2	33.34	0 16.0
10	19 38 49.51	17.874	23 34 47.5	37.23	0 19.2
11	19 45 58.52	+ 17.875	− 23 19 7.0	+ 41.14	0 22.5
12	19 53 7.47	17.869	23 1 52.5	45.07	0 25.7
13	20 0 16.16	17.854	22 43 3.6	49.01	0 28.9
14	20 7 24.39	17.830	22 22 40.0	52.96	0 32.1
15	20 14 31.94	17.797	22 0 41.7	56.91	0 35.3
16	20 21 38.55	+ 17.752	− 21 37 8.6	+ 60.85	0 38.4
17	20 28 43.96	17.696	21 12 1.2	64.78	0 41.6
18	20 35 47.84	17.625	20 45 19.7	68.67	0 44.7
19	20 42 49.86	17.540	20 17 5.4	72.51	0 47.8
20	20 49 49.62	17.437	19 47 19.6	76.30	0 50.8
21	20 56 46.68	+ 17.315	− 19 16 3.8	+ 80.00	0 53.8
22	21 3 40.54	17.170	18 43 20.3	83.60	0 56.8
23	21 10 30.64	17.000	18 9 12.0	87.07	0 59.7
24	21 17 16.30	16.800	17 33 42.2	90.37	1 2.6
25	21 23 56.78	16.568	16 56 55.9	93.47	1 5.4
26	21 30 31.24	+ 16.297	− 16 18 57.7	+ 96.33	1 8.0
27	21 36 58.70	15.983	15 39 54.5	98.88	1 10.5
28	21 43 18.04	15.620	14 59 54.1	101.09	1 12.8
29	21 49 28.01	15.201	14 19 5.4	102.89	1 15.0
30	21 55 27.17	14.718	13 37 39.3	104.19	1 17.1
31	22 1 13.93	+ 14.166	− 12 55 48.5	+ 104.95	1 19.0
32	22 6 46.51	+ 13.536	− 12 13 46.6	+ 105.09	1 20.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	2″.3	2″.3	2″.4	2″.4	2″.5	2″.7	3″.0
Hor. Parallax . .	6.2	6.2	6.3	6.5	6.7	7.2	7.9

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 6 46.51	+ 13.536	− 12 13 46.6	+ 105.09	1 20.6
2	22 12 2.97	12.821	11 31 50.2	104.48	1 21.9
3	22 17 1.17	12.014	10 50 17.9	103.07	1 22.9
4	22 21 38.85	11.110	10 9 29.8	100.78	1 23.6
5	22 25 53.63	10.104	9 29 47.9	97.54	1 23.9
6	22 29 43.02	+ 8.994	− 8 51 35.8	+ 93.27	1 23.8
7	22 33 4.51	7.780	8 15 18.6	87.96	1 23.1
8	22 35 55.67	6.467	7 41 22.2	81.55	1 22.0
9	22 38 14.21	5.063	7 10 12.8	74.05	1 20.4
10	22 39 58.09	3.579	6 42 16.0	65.50	1 18.1
11	22 41 5.62	+ 2.038	− 6 17 56.7	+ 55.95	1 15.2
12	22 41 35.62	+ 0.457	5 57 37.3	45.53	1 11.8
13	22 41 27.47	− 1.136	5 41 37.2	34.36	1 7.7
14	22 40 41.28	2.706	5 30 12.2	22.64	1 3.0
15	22 39 18.04	4.218	5 23 33.0	+ 10 60	0 57.6
16	22 37 19.60	− 5.633	− 5 21 43.7	− 1.52	0 51.7
17	22 34 48.75	6 912	5 24 42.4	13.34	0 45.2
18	22 31 49.20	8.019	5 32 20.1	24.68	0 38.3
19	22 28 25.48	8.920	5 44 20.2	35.16	0 31.0
20	22 24 42.86	9.590	6 0 18.3	44.48	0 23.4
21	22 20 47.14	− 10.011	− 6 19 44.7	− 52.49	0 15.5
22	22 16 44.36	10.178	6 42 4.9	58.93	0 7.5 23 59.6
23	22 12 40.55	10.098	7 6 40.6	63.78	23 51.7
24	22 8 41.53	9.783	7 32 53.0	66.97	23 44.0
25	22 4 52.64	9.258	8 0 2.8	68.59	23 36.5
26	22 1 18.58	− 8.553	− 8 27 33.8	− 68.76	23 29.2
27	21 58 3.26	7.702	8 54 53.1	67.62	23 22.4
28	21 55 9.82	6.736	9 21 31.4	65.38	23 16.0
29	21 52 40.56	5.692	9 47 3.9	62.20	23 10.0
30	21 50 36.98	4.599	10 11 11.2	58.30	23 4.5
31	21 48 59.98	− 3.483	− 10 33 38.0	− 53.85	22 59.3
32	21 47 49.82	− 2.365	− 10 54 12.6	− 48.98	22 54.6

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter	3″.4	3″.9	4″.6	5″.1	5″.3
Horizontal Parallax . .	8.9	10.4	12.1	13.5	14.0

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 52 40.56	– 5.692	– 9 47 3.9	– 62.20	23 10.0
2	21 50 36.98	4.599	10 11 11.2	58.30	23 4.5
3	21 48 59.98	3.463	10 33 38.0	53.85	22 59.3
4	21 47 49.82	2.365	10 54 12.6	48.98	22 54.6
5	21 47 6.33	1.263	11 12 46.8	43.64	22 50.5
6	21 46 48.93	– 0.194	– 11 29 15.6	– 38.53	22 46.7
7	21 46 56.71	+ 0.834	11 43 35.7	33.14	22 43.2
8	21 47 28.60	1.815	11 55 46.1	27.73	22 40.2
9	21 48 23.44	2.745	12 5 46.8	22.35	22 37.4
10	21 49 39.95	3.621	12 13 39.2	17.03	22 35.1
11	21 51 16.83	+ 4.443	– 12 19 25.0	– 11.80	22 33.1
12	21 53 12.78	5.211	12 23 6.5	6.68	22 31.4
13	21 55 26.54	5.927	12 24 46.4	– 1.67	22 29.9
14	21 57 56.86	6.592	12 24 27.6	+ 3.22	22 28.7
15	22 0 42.57	7.210	12 22 13.0	7.98	22 27.8
16	22 3 42.57	+ 7.783	– 12 18 5.5	+ 12.62	22 27.1
17	22 6 55.82	8.315	12 12 8.0	17.15	22 26.5
18	22 10 21.37	8.808	12 4 23.4	21.55	22 26.2
19	22 13 58.33	9.266	11 54 54.5	25.84	22 26.1
20	22 17 45.88	9.691	11 43 43.8	30.03	22 26.2
21	22 21 43.25	+ 10.085	– 11 30 53.8	+ 34.12	22 26.3
22	22 25 49.74	10.452	11 16 27.0	38.10	22 26.6
23	22 30 4.76	10.795	11 0 25.7	42.00	22 27.0
24	22 34 27.74	11.116	10 42 51.9	45.81	22 27.6
25	22 38 58.16	11.416	10 23 47.7	49.53	22 28.2
26	22 43 35.57	+ 11.698	– 10 3 15.1	+ 53.18	22 29.0
27	22 48 19.56	11.962	9 41 15.8	56.75	22 29.9
28	22 53 9.77	12.217	9 17 51.7	60.24	22 30.9
29	22 58 5.89	12.457	8 53 4.6	63.67	22 31.9
30	23 3 7 62	12.686	8 26 55.9	67.04	22 33.1
31	23 8 14.75	+ 12.907	– 7 59 27.2	+ 70.34	22 34.4
32	23 13 27.08	+ 13.119	– 7 30 40.2	+ 73.57	22 35.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	5″.1	4″.7	4″.3	3″.9	3″.6	3″.4
Hor. Parallax . .	13.5	12.5	11.4	10.4	9.6	8.9

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 13 27.08	+ 13.119	– 7 30 40.2	+ 73.57	22 35.8
2	23 18 44.43	13.325	7 0 36.2	76.75	22 37.2
3	23 24 6.66	13.527	6 29 16.6	79.87	22 38.7
4	23 29 33.69	13.725	5 56 42.8	82.93	22 40.2
5	23 35 5.43	13.920	5 22 56.2	85.94	22 41.9
6	23 40 41.84	+ 14.114	– 4 47 58.3	+ 88.88	22 43.7
7	23 46 22.90	14.307	4 11 50.4	91.77	22 45.5
8	23 52 8.60	14 502	3 34 33.8	94.60	22 47.4
9	23 57 59.00	14.699	2 56 10.0	97.37	22 49.4
10	0 3 54.16	14.898	2 16 40.5	100.08	22 51.5
11	0 9 54.13	+ 15.100	– 1 36 6.7	+ 102.73	22 53.6
12	0 15 59.02	15.307	0 54 30.2	105.31	22 55.8
13	0 22 8.95	15.520	– 0 11 52.6	107.82	22 58.1
14	0 28 24.05	15.739	+ 0 31 44.3	110.25	23 0.5
15	0 34 44.50	15.966	1 16 18 5	112.59	23 3.0
16	0 41 10.47	+ 16.200	+ 2 1 48.0	+ 114.85	23 5.6
17	0 47 42.15	16.442	2 48 10.4	117.00	23 8.2
18	0 54 19.75	16 693	3 35 23.3	119.05	23 11.0
19	1 1 3.47	16.952	4 23 23.8	120.97	23 13.9
20	1 7 53.53	17.221	5 12 8.7	122.75	23 16.9
21	1 14 50.15	+ 17.499	+ 6 1 34.5	+ 124.37	23 20.0
22	1 21 53.56	17.786	6 51 37.1	125.82	23 23.3
23	1 29 3.95	18.080	7 42 12.0	127.06	23 26.6
24	1 36 21.48	18.382	8 33 14.0	128.07	23 30.1
25	1 43 46.33	18.690	9 24 37.3	128.82	23 33.7
26	1 51 18.63	+ 19.002	+ 10 16 15.2	+ 129.29	23 37.4
27	1 58 58.41	19.313	11 8 0.5	129.44	23 41.2
28	2 6 45.64	19.623	11 59 45.2	129.22	23 45.2
29	2 14 40.26	19.928	12 51 19.8	128 60	23 49.4
30	2 22 42.09	20.222	13 42 34.7	127.57	23 53.6
31	2 30 50.82	+ 20.502	+ 14 33 19.4	+ 126.07	23 57.9
32	2 39 6.04	+ 20.761	+ 15 23 22.2	+ 124.08	

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	3″.1	3″.0	2″.8	2″.7	2″.6	2″.5
Hor. Parallax . .	8.3	7.8	7.4	7.1	6.8	6.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	2 30 50.82	+20.502	+14 33 19.4	+126.07	23 57.9	1	6 18 53.89	+10.798	+25 3 50.8	−24.12	1 39.5
2	2 39 6.04	20.761	15 23 22.2	124.08		2	6 23 4.41	10.076	24 53 39.2	26.80	1 39.7
3	2 47 27.15	20.995	16 12 31.3	121.58	0 2.3	3	6 26 57.42	9.339	24 42 26.1	29.25	1 39.6
4	2 55 53.53	21.198	17 0 34.2	118.57	0 6.8	4	6 30 32.57	8.588	24 30 17.1	31.47	1 39.3
5	3 4 24.35	21.364	17 47 18.3	115.03	0 11.4	5	6 33 49.53	7.823	24 17 17.6	33.45	1 38.6
6	3 12 58.67	+21.488	+18 32 31.2	+110.98	0 16.1	6	6 36 47.96	+ 7.044	+24 3 33.4	−35.19	1 37.6
7	3 21 35.44	21.567	19 16 1.2	106.44	0 20.8	7	6 39 27.54	6.252	23 49 10.1	36.71	1 36.3
8	3 30 13.51	21.597	19 57 36.8	101.45	0 25.5	8	6 41 47.96	5.448	23 34 13.0	38.01	1 34.7
9	3 38 51.67	21.575	20 37 7.6	96.05	0 30.2	9	6 43 48.95	4.633	23 18 47.6	39.08	1 32.7
10	3 47 28.68	21.500	21 14 24.6	90.32	0 34.9	10	6 45 30.28	3.810	23 2 59.1	39.93	1 30.4
11	3 56 3.26	+21.372	+21 49 20.5	+ 84.30	0 39.5	11	6 46 51.78	+ 2.981	+22 46 52.9	−40.55	1 27.9
12	4 4 34.15	21.193	22 21 49.4	78.07	0 44.1	12	6 47 53.33	2.148	22 30 34.5	40.95	1 24.9
13	4 13 0.13	20.964	22 51 46.7	71.68	0 48.6	13	6 48 34.89	1.316	22 14 9.2	41.12	1 21.7
14	4 21 20.04	20.687	23 19 9.5	65.21	0 53.0	14	6 48 56.55	+ 0.490	21 57 42.3	41.08	1 18.1
15	4 29 32.78	20.364	23 43 56.7	58.73	0 57.3	15	6 48 58.50	− 0.326	21 41 19.1	40.82	1 14.2
16	4 37 37.35	+20.007	+24 6 8.8	+ 52.28	1 1.4	16	6 48 41.06	− 1.125	+21 25 4.9	−40.32	1 10.0
17	4 45 32.80	19.608	24 25 46.9	45.91	1 5.4	17	6 48 4.73	1.898	21 9 5.5	39.59	1 5.4
18	4 53 18.26	19.174	24 42 53.5	39.67	1 9.2	18	6 47 10.20	2.640	20 53 26 2	38.65	1 0.5
19	5 0 52.98	18.710	24 57 32.1	33.59	1 12.9	19	6 45 58.34	3.341	20 38 12.3	37.47	0 55.4
20	5 8 16.24	18.220	25 9 47.2	27.70	1 16.4	20	6 44 30.23	3.992	20 23 29.3	36.07	0 50.0
21	5 15 27.41	+17.705	+25 19 43.3	+ 22.02	1 19.6	21	6 42 47.20	− 4.583	+20 9 22.9	−34.43	0 44.3
22	5 22 25.91	17.166	25 27 25.8	16.56	1 22.6	22	6 40 50.78	5.106	19 55 58.4	32.57	0 38.4
23	5 29 11.21	16.605	25 33 0.3	11.35	1 25.4	23	6 38 42.76	5.549	19 43 21.4	30.48	0 32.3
24	5 35 42.83	16.026	25 36 32.7	6.39	1 28.0	24	6 36 25.12	5.907	19 31 37.3	28.16	0 26.1
25	5 42 0.32	15.428	25 38 9.1	+ 1.68	1 30.3	25	6 33 59.98	6.172	19 20 51.3	25.63	0 19.8
26	5 48 3.27	+14.814	+25 37 55.5	− 2.77	1 32.4	26	6 31 29.68	− 6.336	+19 11 8.5	−22.91	0 13.4
27	5 53 51.27	14.183	25 35 58.3	6.96	1 34.3	27	6 28 56.69	6.396	19 2 33.1	20.01	0 7.0
28	5 59 23.94	13.536	25 32 23.5	10.90	1 35.9	28	6 26 23.51	6.351	18 55 9.4	16.94	0 0.5 23 54.1
29	6 4 40.90	12.874	25 27 17.3	14.58	1 37.2	29	6 23 52.70	6.199	18 49 1.1	13.73	23 47.7
30	6 9 41.78	12.197	25 20 45.7	18.01	1 38.3	30	6 21 26.76	5.945	18 44 11.2	10.41	23 41.5
31	6 14 26.23	+11.505	+25 12 54.9	−21.19	1 39.0	31	6 19 8.14	− 5.590	+18 40 42.1	− 7.01	23 35.4
32	6 18 53.89	+10.798	+25 3 50.8	−24.12	1 39.5	32	6 16 59.14	− 5.140	+18 38 35.2	− 3.56	23 29.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	2″.5	2″.6	2″.7	2″.9	3″.2	3″.5	3″.9	Semidiameter . .	4″.4	4″.9	5″.4	5″.8	6″.0	5″.9
Hor. Parallax . .	6.7	6.8	7.1	7.7	8.4	9.4	10.5	Hor. Parallax . . .	11.7	13.0	14.3	15.3	15.8	15.6

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 19 8.14	− 5.590	+ 18 40 42.1	− 7.01	23 35.4
2	6 16 59.14	5.140	18 38 35.2	3.56	23 29.5
3	6 15 2.11	4.602	18 37 51.3	− 0.10	23 23.8
4	6 13 18.93	3.985	18 38 30.0	+ 3.32	23 18.4
5	6 11 51.41	3.298	18 40 30.2	6.68	23 13.4
6	6 10 41.16	− 2.546	+ 18 43 49.9	+ 9.94	23 8.6
7	6 9 49.62	1.741	18 48 26.0	13.05	23 4.1
8	6 9 17.94	0.892	18 54 14.7	15.98	23 0.0
9	6 9 7.11	− 0.005	19 1 11.4	18.71	22 56.2
10	6 9 17.91	+ 0.910	19 9 10.8	21.20	22 52.7
11	6 9 50.96	+ 1.848	+ 19 18 6.8	+ 23.42	22 49.7
12	6 10 46.76	2.805	19 27 52.7	25.36	22 47.0
13	6 12 5.65	3.774	19 38 21.3	26.97	22 44.8
14	6 13 47.96	4.750	19 49 24.5	28.24	22 43.0
15	6 15 53.72	5.730	20 0 53.9	29.15	22 41.6
16	6 18 23.02	+ 6.712	+ 20 12 40.6	+ 29.68	22 40.4
17	6 21 15.87	7.692	20 24 35.5	29.82	22 39.7
18	6 24 32.20	8.668	20 36 28.7	29.54	22 39.5
19	6 28 11.87	9.637	20 48 10.0	28.83	22 39.6
20	6 32 14.69	10.597	20 59 29.0	27.67	22 40.0
21	6 36 40.41	+ 11.545	+ 21 10 14.5	+ 26.04	22 40.8
22	6 41 28.72	12.478	21 20 15.1	23.93	22 42.0
23	6 46 39.22	13.392	21 29 19.4	21.34	22 43.6
24	6 52 11.42	14.285	21 37 15.6	18.25	22 45.5
25	6 58 4.68	15.149	21 43 51.7	14.66	22 47.8
26	7 4 18.29	+ 15.980	+ 21 48 55.8	+ 10.59	22 50.4
27	7 10 51.40	16.772	21 52 16.3	6.04	22 53.3
28	7 17 42.97	17.518	21 53 42.3	+ 1.06	22 56.5
29	7 24 51.84	18.212	21 53 3.3	− 4.37	23 0.0
30	7 32 16.66	18.846	21 50 9.4	10.18	23 3.7
31	7 39 55.92	+ 19.415	+ 21 44 52.3	− 16.30	23 7.7
32	7 47 47.99	+ 19.912	+ 21 37 4.9	− 22.68	23 11.8

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	5″.5	4″.9	4″.3	3″.8	3″.3	3″.0
Hor. Parallax . .	14.5	13.1	11.5	10.1	8.8	7.9

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 47 47.99	+ 19.912	+ 21 37 4.9	− 22.68	23 11.8
2	7 55 51.09	20.333	21 26 42.1	29.24	23 16 0
3	8 4 3.35	20.675	21 13 40.6	35.90	23 20.4
4	8 12 22.85	20.936	20 57 58.8	42.58	23 24.9
5	8 20 47.66	21.118	20 39 37.6	49.18	23 29.5
6	8 29 15.89	+ 21.222	+ 20 18 39.6	− 55.64	23 34.0
7	8 37 45.73	21.253	19 55 8.8	61.88	23 38.6
8	8 46 15.49	21.216	19 29 11.4	67.85	23 43.1
9	8 54 43.61	21.118	19 0 54.7	73.49	23 47.7
10	9 3 8.70	20.965	18 30 26.9	78.77	23 52.1
11	9 11 29.57	+ 20.767	+ 17 57 56.8	− 83.66	23 56.4
12	9 19 45.21	20.530	17 23 34.6	88.14	
13	9 27 54.77	20.262	16 47 29.5	92.22	0 0.6
14	9 35 57.62	19.972	16 9 51.4	95.89	0 4.8
15	9 43 53.25	19.662	15 30 49.9	99.17	0 8.8
16	9 51 41.28	+ 19.339	+ 14 50 34.3	−102.07	0 12.6
17	9 59 21.48	19.010	14 9 13.2	104.62	0 16.3
18	10 6 53.74	18.678	13 26 55.1	106.84	0 19.9
19	10 14 18.01	18.345	12 43 47.6	108.74	0 23.4
20	10 21 34.32	18.015	11 59 58.0	110.35	0 26.7
21	10 28 42.77	+ 17.690	+ 11 15 33.1	−111.69	0 29.9
22	10 35 43.50	17.372	10 30 39.1	112.78	0 33.0
23	10 42 36.71	17.063	9 45 21.5	113.65	0 36.0
24	10 49 22.61	16.762	8 59 45.6	114.31	0 38.8
25	10 56 1.39	16.471	8 13 56.3	114.78	0 41.5
26	11 2 33.31	+ 16.191	+ 7 27 57.8	−115.07	0 44.1
27	11 8 58.62	15.920	6 41 54.2	115.20	0 46.6
28	11 15 17.55	15.660	5 55 49.2	115.19	0 48.9
29	11 21 30.36	15.410	5 9 46.2	115.04	0 51.2
30	11 27 37.29	15.170	4 23 48.3	114.77	0 53.4
31	11 33 38.57	+ 14.939	+ 3 37 58.4	−114.38	0 55.5
32	11 39 34.42	+ 14.717	+ 2 52 19.1	−113.88	0 57.5

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	2″.7	2″.6	2″.5	2″.4	2″.5	2″.5
Hor. Parallax . .	7.2	6.8	6.6	6.5	6.5	6.6

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 39 34.42	+14.717	+ 2 52 19.1	−113.88	0 57.5
2	11 45 25.05	14.504	2 6 53.0	113.28	0 59.4
3	11 51 10.67	14.299	1 21 42.5	112.58	1 1.2
4	11 56 51.48	14.102	+ 0 36 49.8	111.80	1 3.0
5	12 2 27.64	13.912	− 0 7 43.2	110.93	1 4.6
6	12 7 59.32	+13.728	− 0 51 54.2	−109.98	1 6.2
7	12 13 26.65	13.550	1 35 41.4	108.95	1 7.7
8	12 18 49.77	13.377	2 19 2.9	107.84	1 9.1
9	12 24 8.77	13.207	3 1 56.8	106.65	1 10.4
10	12 29 23.75	13.041	3 44 21.3	105.39	1 11.7
11	12 34 34.77	+12.877	− 4 26 14.8	−104.06	1 13.0
12	12 39 41.87	12.715	5 7 35.4	102.65	1 14.2
13	12 44 45.07	12.552	5 48 21.1	101.16	1 15.3
14	12 49 44.37	12.389	6 28 30.2	99.59	1 16.3
15	12 54 39.74	12.225	7 8 0.7	97.94	1 17.3
16	12 59 31.14	+12.058	− 7 46 50.8	− 96.21	1 18.2
17	13 4 18.48	11.886	8 24 58.4	94.40	1 19.0
18	13 9 1.62	11.708	9 2 21.3	92.49	1 19.8
19	13 13 40.41	11.523	9 38 57.2	90.48	1 20.6
20	13 18 14.67	11.330	10 14 43.8	88.38	1 21.2
21	13 22 44.17	+11.126	−10 49 38.6	− 86.17	1 21.7
22	13 27 8.63	10.910	11 23 38.8	83.83	1 22.1
23	13 31 27.72	10.678	11 56 41.4	81.37	1 22.5
24	13 35 41.05	10.429	12 28 43.4	78.77	1 22.8
25	13 39 48.17	10.161	12 59 41.4	76.03	1 23.0
26	13 43 48.59	+ 9.870	−13 29 31.5	− 73.12	1 23.1
27	13 47 41.73	9.553	13 58 9.7	70.03	1 23.0
28	13 51 26.92	9.207	14 25 31.6	66.75	1 22.8
29	13 55 3.41	8.828	14 51 32.1	63.25	1 22.4
30	13 58 30.36	8.411	15 16 5.6	59.50	1 21.9
31	14 1 46.82	+ 7.953	−15 39 6.0	− 55.49	1 21.3
32	14 4 51.73	+ 7.448	−16 0 26.5	− 51.18	1 20.5

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	14 1 46.82	+ 7.953	−15 39 6.0	− 55.49	1 21.3
2	14 4 51.73	7.448	16 0 26.5	51.18	1 20.5
3	14 7 43.91	6.891	16 19 59.8	46.54	1 19.4
4	14 10 22.06	6.278	16 37 37.5	41.54	1 18.1
5	14 12 44.76	5.603	16 53 10.4	36.13	1 16.5
6	14 14 50.48	+ 4.861	−17 6 28.1	− 30.26	1 14.7
7	14 16 37.52	4.046	17 17 19.1	23.90	1 12.5
8	14 18 4.11	3.156	17 25 30.8	16.99	1 10.0
9	14 19 8.41	2.189	17 30 49.8	9.49	1 7.1
10	14 19 48.56	1.143	17 33 1.3	− 1.36	1 3.7
11	14 20 2.69	+ 0.022	−17 31 49.9	+ 7.42	1 0.0
12	14 19 49.04	− 1.170	17 26 59.6	16.88	0 55.9
13	14 19 6.06	2.420	17 18 14.4	27.00	0 51.2
14	14 17 52.57	3.709	17 5 19.0	37.72	0 46.0
15	14 16 7.93	5.012	16 48 0.4	48.90	0 40.3
16	14 13 52.16	− 6.296	−16 26 9.7	+ 60.35	0 34.1
17	14 11 6.24	7.518	15 59 43.7	71.80	0 27.4
18	14 7 52.19	8.631	15 28 46.4	82.88	0 20.3
19	14 4 13.25	9.581	14 53 32.5	93.11	0 12.8
20	14 0 14.05	10.311	14 14 28.6	101.95	0 4.9 23 56.7
21	13 56 0.45	−10.774	−13 32 14.4	+108.86	23 48.4
22	13 51 39.34	10.930	12 47 42.8	113.32	23 40.2
23	13 47 18.47	10.752	12 1 58.0	114.90	23 32.1
24	13 43 5.90	10.238	11 16 12.1	113.38	23 24.2
25	13 39 9.59	9.402	10 31 40.9	108.70	23 16.8
26	13 35 36.87	− 8.280	− 9 49 38.3	+101.04	23 9.8
27	13 32 34.04	6.920	9 11 11.4	90.80	23 3.3
28	13 30 6.09	5.385	8 37 16.2	78.50	22 57.6
29	13 28 16.45	3.736	8 8 34.8	64.75	22 52.4
30	13 27 7.11	2.037	7 45 35.0	50.14	22 48.0
31	13 26 38.70	− 0.336	− 7 28 30.3	+ 35.25	22 44.3
32	13 26 50.63	+ 1.319	− 7 17 21.5	+ 20.58	22 41.1

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	2″.6	2″.7	2″.8	2″.9	3″.1	3″.3
Hor. Parallax . .	6.8	7.0	7.3	7.7	8.2	8.9

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	3″.7	4″.1	4″.5	4″.8	5″.0	4″.6
Hor. Parallax . .	9.7	10.7	11.9	13.0	13.2	12.1

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 26 50.63	+ 1.319	− 7 17 21.5	+ 20.58	22 41.1
2	13 27 41.38	2.894	7 11 57.9	+ 6.46	22 38.5
3	13 29 8.72	4.365	7 12 3.6	− 6.76	22 36.6
4	13 31 9.98	5.718	7 17 13.6	18.92	22 35.2
5	13 33 42.20	6.945	7 27 1.6	29.90	22 34.3
6	13 36 42.34	+ 8.046	− 7 40 59.0	− 39.68	22 33.7
7	13 40 7.44	9.026	7 58 36.7	48.26	22 33.6
8	13 43 54.68	9.892	8 19 26.4	55.69	22 33.8
9	13 48 1.41	10.652	8 43 1.2	62.03	22 34.2
10	13 52 25.20	11.318	9 8 55.7	67.36	22 34.9
11	13 57 3.88	+ 11.894	− 9 36 47.1	− 71.79	22 35.8
12	14 1 55.53	12.398	10 6 14.4	75.36	22 36.9
13	14 6 58.45	12.836	10 36 58.5	78.20	22 38.1
14	14 12 11.21	13.219	11 8 42.8	80.38	22 39.5
15	14 17 32.55	13.552	11 41 12.3	81.98	22 41.0
16	14 23 1.36	+ 13.843	− 12 14 13.9	− 83.07	22 42.7
17	14 28 36.72	14.099	12 47 36.1	83.71	22 44.5
18	14 34 17.88	14.326	13 21 8.7	83.94	22 46.3
19	14 40 4.16	14.527	13 54 42.3	83.81	22 48.2
20	14 45 55.01	14.708	14 28 9.3	83.38	22 50.2
21	14 51 49.99	+ 14.872	− 15 1 22.6	− 82.68	22 52.3
22	14 57 48.71	15.022	15 34 16.2	81.75	22 54.4
23	15 3 50.87	15.158	16 6 44.7	80.60	22 56.5
24	15 9 56.20	15.285	16 38 43.3	79.26	22 58.7
25	15 16 4.49	15.404	17 10 7.7	77.74	23 0.9
26	15 22 15.56	+ 15.518	− 17 40 53.8	− 76.08	23 3.2
27	15 28 29.29	15.625	18 10 58.4	74.28	23 5.5
28	15 34 45.57	15.730	18 40 18.3	72.35	23 7.9
29	15 41 4.31	15.830	19 8 50.5	70.32	23 10.4
30	15 47 25.43	15.928	19 36 32.6	68.18	23 12.8
31	15 53 48.86	+ 16.024	− 20 3 22.1	− 65.94	23 15.3
32	16 0 14.58	+ 16.119	− 20 29 16.9	− 63.61	23 17.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	3.″9	3.″4	3.″0	2.″8	2.″6	2.″5
Horizontal Parallax	10.5	9.0	8.0	7.3	6.8	6.5

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	15 53 48.86	+ 16.024	− 20 3 22.1	− 65.94	23 15.3
2	16 0 14.58	16.119	20 29 16.9	63.61	23 17.8
3	16 6 42.55	16.212	20 54 14.8	61.20	23 20.4
4	16 13 12.73	16.303	21 18 13.7	58.70	23 23.0
5	16 19 45.09	16.394	21 41 11.8	56 13	23 25.6
6	16 26 19.61	+ 16.483	− 22 3 7.5	− 53.50	23 28.3
7	16 32 56.26	16.571	22 23 59.0	50.78	23 31.0
8	16 39 35.02	16.658	22 43 44.5	48.00	23 33.7
9	16 46 15.86	16.744	23 2 22.5	45.16	23 36.5
10	16 52 58.74	16.829	23 19 51.5	42.25	23 39.3
11	16 59 43.64	+ 16.912	− 23 36 10.0	− 39.28	23 42.2
12	17 6 30.51	16.993	23 51 16.5	36.25	23 45.1
13	17 13 19.30	17.072	24 5 9.4	33.15	23 48.0
14	17 20 9.96	17.149	24 17 47.3	30.00	23 50.9
15	17 27 2.45	17.224	24 29 9.0	26 80	23 53.9
16	17 33 56.71	+ 17.297	− 24 39 13.1	− 23.53	23 56.9
17	17 40 52.66	17.365	24 47 58.0	20.20	23 59.9
18	17 47 50.21	17.430	24 55 22.5	16.83	
19	17 54 49.28	17.492	25 1 25.3	13.40	0 3.0
20	18 1 49.79	17.550	25 6 5.1	9.91	0 6.0
21	18 8 51.62	+ 17.602	− 25 9 20.5	− 6.37	0 9.0
22	18 15 54.65	17.649	25 11 10.3	− 2.78	0 12.1
23	18 22 58.74	17.691	25 11 33.3	+ 0.86	0 15.3
24	18 30 3.78	17.727	25 10 28.4	4.55	0 18.4
25	18 37 9.59	17.756	25 7 54.5	8.28	0 21.6
26	18 44 16.01	+ 17.778	− 25 3 50.5	+ 12.06	0 24.8
27	18 51 22.86	17.792	24 58 15.4	15.87	0 28.0
28	18 58 29.93	17.796	24 51 8.3	19.72	0 31.1
29	19 5 37.00	17.791	24 42 28.4	23.61	0 34.3
30	19 12 43.82	17.775	24 32 15.0	27.52	0 37.5
31	19 19 50.10	+ 17.747	− 24 20 27.5	+ 31.44	0 40.7
32	19 26 55.55	+ 17.706	− 24 7 5.6	+ 35.38	0 43.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	2.″4	2.″3	2.″3	2.″3	2.″3	2.″4	2.″5
Hor. Parallax . .	6.3	6.2	6.1	6.1	6.2	6.3	6.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 55 14.50	+ 13.685	− 23 21 52.2	− 7.74	23 12.6
2	18 0 43.05	13.695	23 24 36.6	5.94	23 14.2
3	18 6 11.81	13.701	23 26 37.7	4.14	23 15 7
4	18 11 40.70	13.706	23 27 55.4	2.33	23 17.3
5	18 17 9.66	13.707	23 28 29.6	− 0.52	23 18.8
6	18 22 38.64	+ 13.707	− 23 28 20.2	+ 1.30	23 20.3
7	18 28 7.58	13.703	23 27 27.2	3.11	23 21.8
8	18 33 36.42	13.698	23 25 50.6	4.93	23 23.4
9	18 39 5.09	13.690	23 23 30.6	6.75	23 24.9
10	18 44 33.54	13.680	23 20 27.0	8.56	23 26.5
11	18 50 1.71	+ 13.666	− 23 16 39.9	+ 10.36	23 28.0
12	18 55 29.53	13.651	23 12 9.6	12.16	23 29.5
13	19 0 56.95	13.633	23 6 56.4	13.95	23 31.0
14	19 6 23.91	13.612	23 1 0.3	15.73	23 32.5
15	19 11 50.34	13.589	22 54 21.6	17.50	23 34.0
16	19 17 16.19	+ 13.564	− 22 47 0.6	+ 19.25	23 35.5
17	19 22 41.41	13.536	22 38 57.7	20.99	23 37.0
18	19 28 5.94	13.507	22 30 13.1	22.71	23 38.4
19	19 33 29.73	13.475	22 20 47.3	24.42	23 39.8
20	19 38 52.73	13.442	22 10 40.6	26.12	23 41.2
21	19 44 14.90	+ 13.406	− 21 59 53.6	+ 27.80	23 42.7
22	19 49 36.19	13.368	21 48 26.5	29.45	23 44.0
23	19 54 56.55	13.329	21 36 19.9	31.09	23 45.4
24	20 0 15.94	13.288	21 23 34.4	32.70	23 46.7
25	20 5 34.33	13.246	21 10 10.5	34.29	23 48.1
26	20 10 51.68	+ 13.201	− 20 56 8.7	+ 35.86	23 49.4
27	20 16 7.95	13.155	20 41 29.5	37.40	23 50.7
28	20 21 23.13	13.108	20 26 13.5	38.92	23 52.0
29	20 26 37.18	13.060	20 10 21.3	40.42	23 53.3
30	20 31 50.09	13.012	19 53 53.6	41.89	23 54.6
31	20 37 1.83	+ 12.963	− 19 36 51.0	+ 43.33	23 55.8
32	20 42 12.39	+ 12.915	− 19 19 14.0	+ 44.74	23 57.0

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	5″.2	5″.1	5″.1	5″.1	5″.0	5″.0	5″.0
Hor. Parallax . .	5.3	5.3	5.3	5.2	5.2	5.2	5.2

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 42 12.39	+ 12.915	− 19 19 14.0	+ 44.74	23 57.0
2	20 47 21.77	12.865	19 1 3.3	46.13	23 58.2
3	20 52 29.94	12.815	18 42 19.7	47.50	23 59.4
4	20 57 36.90	12.765	18 23 3.8	48.83	
5	21 2 42.64	12.714	18 3 16.4	50.13	0 0.6
6	21 7 47.16	+ 12.663	− 17 42 58.0	+ 51.40	0 1.8
7	21 12 50.46	12.612	17 22 9.4	52.64	0 2.9
8	21 17 52.54	12.561	17 0 51.4	53.85	0 4.0
9	21 22 53.40	12 510	16 39 4.7	55.03	0 5.1
10	21 27 53.04	12.460	16 16 49.9	56 18	0 6.1
11	21 32 51.48	+ 12.410	− 15 54 7.9	+ 57.31	0 7.1
12	21 37 48.72	12.360	15 30 59.4	58.41	0 8.1
13	21 42 44.78	12.311	15 7 25.1	59.47	0 9.1
14	21 47 39.67	12.263	14 43 25.7	60.49	0 10.0
15	21 52 33.40	12.215	14 19 2.2	61.48	0 11.0
16	21 57 25.99	+ 12.168	− 13 54 15.3	+ 62 43	0 11.9
17	22 2 17.45	12.121	13 29 5.7	63.36	0 12.8
18	22 7 7.81	12.075	13 3 34.2	64.26	0 13.7
19	22 11 57.07	12.031	12 37 41.6	65.12	0 14.6
20	22 16 45.26	11.986	12 11 28.8	65.95	0 15.5
21	22 21 32.40	+ 11.943	− 11 44 56.5	+ 66.75	0 16.3
22	22 26 18.52	11.901	11 18 5.4	67.52	0 17.2
23	22 31 3.65	11.860	10 50 56.2	68.25	0 18.0
24	22 35 47.82	11.820	10 23 29.9	68.95	0 18.8
25	22 40 31.05	11.782	9 55 47.1	69.61	0 19.6
26	22 45 13.37	+ 11.745	− 9 27 48.6	+ 70.25	0 20.3
27	22 49 54.81	11.709	8 59 35.2	70.86	0 21.0
28	22 54 35.42	11.675	8 31 7.6	71.43	0 21.7
29	22 59 15.23	11.643	8 2 26.7	71.98	0 22.4
30	23 3 54.28	11.611	7 33 33.0	72.40	0 23.2
31	23 8 32.60	+ 11.582	− 7 4 27.4	+ 72.97	0 23.9
32	23 13 10.23	+ 11.554	− 6 35 10.6	+ 73.42	0 24.6

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter	5″.0	5″.0	5″.0	5″.0	5″.0
Horizontal Parallax . .	5.2	5.2	5.2	5.2	5.2

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 59 15.23	+11.643	− 8 2 26.7	+ 71.98	0 22.4
2	23 3 54.28	11.611	7 33 33.0	72.49	0 23.2
3	23 8 32.60	11.582	7 4 27.4	72.97	0 23.9
4	23 13 10.23	11.554	6 35 10.6	73.42	0 24.6
5	23 17 47.21	11.527	6 5 43.3	73.85	0 25.3
6	23 22 23.59	+11.503	− 5 36 6.3	+ 74.24	0 25.9
7	23 26 59.40	11.481	5 6 20.2	74.60	0 26.6
8	23 31 34.69	11.460	4 36 25.9	74.93	0 27.3
9	23 36 9.50	11.441	4 6 24.1	75.22	0 28.0
10	23 40 43.87	11.424	3 36 15.5	75.49	0 28.6
11	23 45 17.84	+11.408	− 3 6 0.9	+ 75.73	0 29.2
12	23 49 51.45	11.395	2 35 40.9	75.93	0 29.8
13	23 54 24.76	11.382	2 5 16.4	76.11	0 30.4
14	23 58 57.79	11.372	1 34 48.1	76.26	0 31.0
15	0 3 30.59	11.363	1 4 16.7	76.37	0 31.6
16	0 8 3.21	+11.356	− 0 33 42.9	+ 76.45	0 32.2
17	0 12 35.68	11.351	− 0 3 7.5	76.50	0 32.8
18	0 17 8.04	11.347	+ 0 27 28.8	76.52	0 33.5
19	0 21 40.33	11.345	0 58 5.3	76.51	0 34.0
20	0 26 12.60	11.345	1 28 41.1	76.47	0 34.6
21	0 30 44.89	+11.347	+ 1 59 15.5	+ 76.40	0 35.2
22	0 35 17.23	11.350	2 29 47.8	76.29	0 35.8
23	0 39 49.67	11.355	3 0 17.3	76.16	0 36.4
24	0 44 22.26	11.361	3 30 43.2	75.99	0 37.0
25	0 48 55.02	11.370	4 1 4.8	75.80	0 37.6
26	0 53 28.00	+11.380	+ 4 31 21.4	+ 75.58	0 38.2
27	0 58 1.24	11.391	5 1 32.2	75.32	0 38.8
28	1 2 34.77	11.405	5 31 36.5	75.03	0 39.4
29	1 7 8.64	11.420	6 1 33.6	74.71	0 40.0
30	1 11 42.90	11.436	6 31 22.7	74.36	0 40.7
31	1 16 17.58	+11.455	+ 7 1 3.0	+ 73.98	0 41.3
32	1 20 52.73	+11.475	+ 7 30 34.0	+ 73.58	0 42.0

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	5.″0	5.″0	5.″0	5.″0	5.″0	5.″0
Hor. Parallax . .	5.2	5.2	5.2	5.2	5.2	5.2

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	1 20 52.73	+11.475	+ 7 30 34.0	+ 73.56	0 42.0
2	1 25 28.38	11.497	7 59 54.8	73.15	0 42.6
3	1 30 4.58	11.521	8 29 4.8	72.69	0 43.2
4	1 34 41.36	11.545	8 58 3.2	72.19	0 43.8
5	1 39 18.75	11.572	9 26 49.3	71.66	0 44.5
6	1 43 56.81	+11.601	+ 9 55 22.3	+ 71.10	0 45.1
7	1 48 35.57	11.630	10 23 41.5	70.50	0 45.8
8	1 53 15.05	11.662	10 51 46.2	69.88	0 46.5
9	1 57 55.30	11.695	11 19 35.6	69.23	0 47.2
10	2 2 36.35	11.728	11 47 8.9	68.54	0 48.0
11	2 7 18.23	+11.763	+ 12 14 25.5	+ 67.83	0 48.8
12	2 12 0.98	11.800	12 41 24.5	67.09	0 49.6
13	2 16 44.62	11.838	13 8 5.2	66.31	0 50.5
14	2 21 29.18	11.877	13 34 26.9	65.50	0 51.3
15	2 26 14.69	11.916	14 0 28.8	64.66	0 52.1
16	2 31 1.17	+11.957	+ 14 26 10.1	+ 63.79	0 52.9
17	2 35 48.64	11.999	14 51 30.1	62.88	0 53.8
18	2 40 37.10	12.041	15 16 28.0	61.94	0 54.7
19	2 45 26.59	12.084	15 41 3.0	60.97	0 55.6
20	2 50 17.12	12.127	16 5 14.5	59.97	0 56.5
21	2 55 8.70	+12.171	+ 16 29 1.6	+ 58.94	0 57.4
22	3 0 1.34	12.216	16 52 23.6	57.88	0 58.3
23	3 4 55.06	12.261	17 15 19.8	56.79	0 59.3
24	3 9 49.86	12.306	17 37 49.5	55.67	1 0.3
25	3 14 45.75	12.351	17 59 51.9	54.52	1 1.3
26	3 19 42.74	+12.397	+ 18 21 26.1	+ 53.34	1 2.3
27	3 24 40.83	12.442	18 42 31.6	52.13	1 3.3
28	3 29 40.01	12.488	19 3 7.7	50.89	1 4.3
29	3 34 40.28	12.534	19 23 13.5	49.62	1 5.4
30	3 39 41.65	12.579	19 42 48.5	48.32	1 6.5
31	3 44 44.10	+12.624	+ 20 1 52.0	+ 46.99	1 7.6
32	3 49 47.63	+12.669	+ 20 20 23.4	+ 45.63	1 8.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	5.″1	5.″1	5.″1	5.″2	5.″2	5.″2
Hor. Parallax . .	5.2	5.3	5.3	5.3	5.4	5.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	3 44 44.10	+12.624	+20 1 52.0	+46.99	1 7.6
2	3 49 47.63	12.669	20 20 23.4	45.63	1 8.7
3	3 54 52.23	12.713	20 38 21.8	44.24	1 9.8
4	3 59 57.89	12.758	20 55 46.8	42.83	1 10.9
5	4 5 4.60	12.801	21 12 37.5	41.39	1 12.1
6	4 10 12.34	+12.844	+21 28 53.4	+39.93	1 13.3
7	4 15 21.09	12.886	21 44 34.0	38.44	1 14.5
8	4 20 30.83	12.927	21 59 38.6	36.93	1 15.7
9	4 25 41.53	12.966	22 14 6.5	35.39	1 17.0
10	4 30 53.16	13.004	22 27 57.2	33.83	1 18.2
11	4 36 5.69	+13.040	+22 41 10.2	+32.25	1 19.5
12	4 41 19.10	13.075	22 53 45.0	30.65	1 20.8
13	4 46 33.33	13.109	23 5 41.1	29.02	1 22.1
14	4 51 48.35	13.141	23 16 58.0	27.37	1 23.4
15	4 57 4.12	13.172	23 27 35.1	25.71	1 24.7
16	5 2 20.59	+13.201	+23 37 32.1	+24.03	1 26.0
17	5 7 37.72	13.227	23 46 48.6	22.34	1 27.4
18	5 12 55.44	13.250	23 55 24.3	20.63	1 28.7
19	5 18 13.71	13.272	24 3 18.6	18.90	1 30.1
20	5 23 32.46	13.291	24 10 31.3	17.16	1 31.4
21	5 28 51.65	+13.308	+24 17 2.0	+15.40	1 32.8
22	5 34 11.21	13.322	24 22 50.6	13.64	1 34.2
23	5 39 31.09	13.334	24 27 56.7	11.86	1 35.6
24	5 44 51.21	13.344	24 32 20.2	10.08	1 37.0
25	5 50 11.53	13.350	24 36 0.9	8.29	1 38.4
26	5 55 31.98	+13.355	+24 38 58.6	+ 6.50	1 39.8
27	6 0 52.50	13.356	24 41 13.2	4.71	1 41.2
28	6 6 13.02	13.355	24 42 44.7	2.91	1 42.6
29	6 11 33.47	13.351	24 43 33.0	+ 1.11	1 44.0
30	6 16 53.79	13.344	24 43 38.1	− 0.69	1 45.4
31	6 22 13.93	+13.334	+24 43 0.0	− 2.49	1 46.9
32	6 27 33.83	+13.322	+24 41 38.6	− 4.29	1 48.3

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	6 27 33.83	+13.322	+24 41 38.6	− 4.29	1 48.3
2	6 32 53.42	13.308	24 39 34.1	6.08	1 49.7
3	6 38 12.63	13.292	24 36 46.7	7.87	1 51.1
4	6 43 31.42	13.273	24 33 16.3	9.65	1 52.4
5	6 48 49.72	13.251	24 29 3.2	11.43	1 53.8
6	6 54 7.48	+13.227	+24 24 7.5	−13.20	1 55.1
7	6 59 24.63	13.201	24 18 29.5	14.96	1 56.4
8	7 4 41.12	13.173	24 12 9.5	16.71	1 57.7
9	7 9 56.89	13.143	24 5 7.8	18.45	1 59.0
10	7 15 11.90	13.110	23 57 24.5	20.17	2 0.3
11	7 20 26.09	+13.074	+23 49 0.1	−21.87	2 1.6
12	7 25 39.41	13.037	23 39 55.0	23 55	2 2.9
13	7 30 51.82	12.997	23 30 9.5	25.22	2 4.2
14	7 36 3.24	12.955	23 19 44.1	26.87	2 5.4
15	7 41 13.64	12.912	23 8 39.3	28.51	2 6.6
16	7 46 22.99	+12.866	+22 56 55.5	−30.13	2 7.8
17	7 51 31.24	12.819	22 44 33.3	31.73	2 9.0
18	7 56 38.34	12.771	22 31 33.1	33.30	2 10.2
19	8 1 44.26	12.721	22 17 55.4	34.84	2 11.4
20	8 6 48.95	12.670	22 3 40.8	36.36	2 12.5
21	8 11 52.38	+12.617	+21 48 49.9	−37.86	2 13.6
22	8 16 54.52	12.562	21 33 23.2	39.34	2 14.7
23	8 21 55.35	12.507	21 17 21.4	40.79	2 15.8
24	8 26 54.84	12.450	21 0 45.2	42.21	2 16.8
25	8 31 52.98	12.393	20 43 35.3	43.61	2 17.8
26	8 36 49.74	+12.335	+20 25 52.1	−44.98	2 18.8
27	8 41 45.11	12.276	20 7 36.4	46.32	2 19.8
28	8 46 39.06	12.218	19 48 48.8	47.63	2 20.8
29	8 51 31.59	12.159	19 29 29.9	48.92	2 21.7
30	8 56 22.69	12.100	19 9 40.4	50.18	2 22.6
31	9 1 12.36	+12.040	+18 49 21.1	−51.41	2 23.5
32	9 6 0.60	+11.980	+18 28 32.7	−52.62	2 24.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	5″.3	5″.3	5″.4	5″.5	5″.6	5″.6	5″.7
Hor. Parallax . .	5.5	5.5	5.6	5.7	5.8	5.8	5.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	5″.8	5″.9	6″.0	6″.2	6″.3	6″.5
Hor. Parallax . . .	6.0	6.1	6.3	6.4	6.5	6.7

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 1 12.36	+ 12.040	+ 18 49 21.1	− 51.41	2 23.5
2	9 6 0.60	11.980	18 28 32.7	52.62	2 24.3
3	9 10 47.40	11.920	18 7 15.7	53.79	2 25.2
4	9 15 32.77	11.861	17 45 30.9	54.94	2 26.0
5	9 20 16.72	11.801	17 23 18.9	56.05	2 26.8
6	9 24 59.26	+ 11.742	+ 17 0 40.5	− 57.14	2 27.6
7	9 29 40.39	11.683	16 37 36.3	58.20	2 28.4
8	9 34 20.12	11.625	16 14 7.1	59.23	2 29.1
9	9 38 58.46	11.568	15 50 13.6	60.23	2 29.8
10	9 43 35.43	11.512	15 25 56.4	61.20	2 30.5
11	9 48 11.04	+ 11.456	+ 15 1 16.4	− 62.14	2 31.1
12	9 52 45.30	11.401	14 36 14.3	63.05	2 31.7
13	9 57 18.24	11.346	14 10 50.6	63.93	2 32.3
14	10 1 49.88	11.291	13 45 6.3	64.77	2 32.9
15	10 6 20.22	11.237	13 19 2.0	65.59	2 33.5
16	10 10 49.29	+ 11.185	+ 12 52 38.3	− 66.38	2 34.0
17	10 15 17.10	11.133	12 25 56.1	67.14	2 34.5
18	10 19 43.68	11.082	11 58 56.1	67.86	2 35.0
19	10 24 9.05	11.031	11 31 39.0	68.56	2 35.5
20	10 28 33.23	10.982	11 4 5.4	69.23	2 35.9
21	10 32 56.24	+ 10.934	+ 10 36 16.2	− 69.87	2 36.4
22	10 37 18.10	10.887	10 8 12.1	70.48	2 36.8
23	10 41 38.83	10.841	9 39 53.8	71.05	2 37.2
24	10 45 58.46	10.796	9 11 21.9	71.60	2 37.6
25	10 50 17.02	10.752	8 42 37.2	72.13	2 38.0
26	10 54 34.54	+ 10.710	+ 8 13 40.3	− 72.62	2 38.3
27	10 58 51.06	10.668	7 44 32.0	73.08	2 38.6
28	11 3 6.60	10.627	7 15 12.7	73.51	2 38.9
29	11 7 21.18	10.588	6 45 43.3	73.92	2 39.2
30	11 11 34.84	10.550	6 16 4.5	74.30	2 39.5
31	11 15 47.61	+ 10.514	+ 5 46 16.9	− 74.66	2 39.8
32	11 19 59.53	+ 10.479	+ 5 16 21.1	− 74.99	2 40.1

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 19 59.53	+ 10.479	+ 5 16 21.1	− 74.99	2 40.1
2	11 24 10.62	10.445	4 46 17.7	75.29	2 40.3
3	11 28 20.92	10.413	4 16 7.5	75.57	2 40.5
4	11 32 30.47	10.382	3 45 51.0	75.81	2 40.7
5	11 36 39.31	10.353	3 15 28.9	76.03	2 40.9
6	11 40 47.47	+ 10.326	+ 2 45 1.8	− 76.23	2 41.1
7	11 44 54.98	10.300	2 14 30.3	76.40	2 41.3
8	11 49 1.87	10.275	1 43 55.1	76.54	2 41.5
9	11 53 8.18	10.252	1 13 16.8	76.65	2 41.6
10	11 57 13.94	10.230	0 42 36.1	76.74	2 41.8
11	12 1 19.19	+ 10.209	+ 0 11 53.6	− 76.80	2 41.9
12	12 5 23.95	10.189	− 0 18 50.1	76.83	2 42.1
13	12 9 28.25	10.171	0 49 34.3	76.84	2 42.2
14	12 13 32.11	10.153	1 20 18.4	76.83	2 42.4
15	12 17 35.56	10.136	1 51 1.7	76.79	2 42.5
16	12 21 38.63	+ 10.120	− 2 21 43.6	− 76.71	2 42.6
17	12 25 41.35	10.106	2 52 23.5	76.61	2 42.7
18	12 29 43.74	10.093	3 23 0.7	76.49	2 42.8
19	12 33 45.81	10.080	3 53 34.5	76.33	2 42.8
20	12 37 47.60	10.009	4 24 4.3	76.16	2 42.9
21	12 41 49.13	+ 10.059	− 4 54 29.5	− 75.95	2 43.0
22	12 45 50.41	10.049	5 24 49.4	75.72	2 43.1
23	12 49 51.46	10.040	5 55 3.4	75.46	2 43.1
24	12 53 52.30	10.031	6 25 11.0	75.18	2 43.2
25	12 57 52.96	10.024	6 55 11.4	74.87	2 43.3
26	13 1 53.45	+ 10.018	− 7 25 4.1	− 74.53	2 43.4
27	13 5 53.81	10.012	7 54 48.5	74.17	2 43.5
28	13 9 54.04	10.007	8 24 24.0	73.79	2 43.6
29	13 13 54.16	10.003	8 53 49.9	73.38	2 43.6
30	13 17 54.19	9.999	9 23 5.7	72.94	2 43.7
31	13 21 54.15	+ 9.996	− 9 52 10.8	− 72.48	2 43.7
32	13 25 54.04	+ 9.994	− 10 21 4.7	− 72.00	2 43.8

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	6″.6	6″.8	7″.0	7″.2	7″.4	7″.6
Hor. Parallax . .	6.9	7.0	7.2	7.4	7.7	7.9

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	7″.9	8″.2	8″.5	8″.8	9″.2	9″.6
Hor. Parallax . .	8.2	8.5	8.8	9.1	9.5	9.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	13 25 54.04	+ 9.994	− 10 21 4.7	− 72.00	2 43.8	1	15 25 9.33	+ 9.702	− 22 31 56.7	− 46.36	2 44.6
2	13 29 53.88	9.993	10 49 46.7	71.49	2 43 8	2	15 29 1.69	9.662	22 50 15.3	45.18	2 44.6
3	13 33 53.69	9.992	11 18 15.9	70.95	2 43.9	3	15 32 53.06	9.619	23 8 5.4	43.99	2 44.5
4	13 37 53.49	9.992	11 46 31.9	70.39	2 43.9	4	15 36 43.36	9.573	23 25 26.7	42.78	2 44.4
5	13 41 53.29	9.992	12 14 34.3	69.81	2 44.0	5	15 40 32.50	9.522	23 42 18.8	41.55	2 44.3
6	13 45 53.09	+ 9.992	− 12 42 22.6	− 69.21	2 44 0	6	15 44 20.36	+ 9.467	− 23 58 41.4	− 40.32	2 44.1
7	13 49 52.90	9.993	13 9 56.1	68.58	2 44.1	7	15 48 6.84	9.407	24 14 34.0	39.07	2 43.9
8	13 53 52.73	9.993	13 37 14.0	67.92	2 44.1	8	15 51 51.83	9.342	24 29 56.5	37.81	2 43.7
9	13 57 52.57	9.994	14 4 15.9	67.23	2 44.2	9	15 55 35.20	9.272	24 44 48.6	36.54	2 43.5
10	14 1 52.43	9.994	14 31 1.1	66.53	2 44.2	10	15 59 16.84	9.196	24 59 10.0	35.25	2 43.3
11	14 5 52.29	+ 9.994	− 14 57 29.2	− 65.80	2 44.3	11	16 2 56.61	+ 9.115	− 25 13 0.4	− 33.95	2 43.0
12	14 9 52.13	9.993	15 23 39.5	65.05	2 44.3	12	16 6 34.36	9.028	25 26 19.6	32.64	2 42.7
13	14 13 51.95	9.992	15 49 31.4	64.27	2 44.4	13	16 10 9.93	8.934	25 39 7.5	31.33	2 42.3
14	14 17 51.74	9.990	16 15 4.2	63.47	2 44.4	14	16 13 43.15	8.833	25 51 23.7	30.01	2 41.9
15	14 21 51.47	9.987	16 40 17.5	62.64	2 44.5	15	16 17 13.86	8.725	26 3 8.1	28.68	2 41.5
16	14 25 51.12	+ 9.983	− 17 5 10.6	− 61.79	2 44.5	16	16 20 41.89	+ 8.609	− 26 14 20.6	− 27.36	2 41.0
17	14 29 50.66	9.978	17 29 43.0	60.91	2 44.6	17	16 24 7.05	8.485	26 25 1.1	26.02	2 40.5
18	14 33 50.06	9.972	17 53 54.0	60.01	2 44.6	18	16 27 29.13	8.353	26 35 9.4	24.68	2 39.9
19	14 37 49.29	9.964	18 17 43.2	59.08	2 44.6	19	16 30 47.95	8.212	26 44 45.4	23.33	2 39.3
20	14 41 48.30	9.954	18 41 10.0	58.14	2 44 7	20	16 34 3.29	8.063	26 53 49.0	21.98	2 38.6
21	14 45 47.05	+ 9.942	− 19 4 13.8	− 57.17	2 44.7	21	16 37 14.92	+ 7.904	− 27 2 20.1	− 20.62	2 37.8
22	14 49 45.50	9.928	19 26 54.0	56.18	2 44.7	22	16 40 22.63	7.736	27 10 18.5	19.26	2 37.0
23	14 53 43.59	9.912	19 49 10.3	55.17	2 44.7	23	16 43 26.20	7.558	27 17 44.2	17.90	2 36.1
24	14 57 41.29	9.895	20 11 2.0	54.14	2 44.8	24	16 46 25.39	7.370	27 24 37.3	16.54	2 35.1
25	15 1 38.54	9.876	20 32 28.7	53.08	2 44.8	25	16 49 19.96	7.173	27 30 57.7	15.17	2 34.0
26	15 5 35.29	+ 9.854	− 20 53 29.8	− 52.01	2 44.8	26	16 52 9.67	+ 6.966	− 27 36 45.3	− 13.80	2 32.9
27	15 9 31.48	9.829	21 14 4.9	50.92	2 44.8	27	16 54 54.26	6.747	27 42 0.0	12.44	2 31.7
28	15 13 27.05	9.801	21 34 13.6	49.81	2 44.8	28	16 57 33.48	6.518	27 46 41.8	11.07	2 30.4
29	15 17 21.93	9.771	21 53 55.4	48.68	2 44.7	29	17 0 7.06	6.278	27 50 50.5	9.69	2 29.0
30	15 21 16.05	9.738	22 13 9.9	47.53	2 44.7	30	17 2 34.75	6.026	27 54 26.2	8.31	2 27.5
31	15 25 9.33	+ 9.702	− 22 31 56.7	− 46.36	2 44.6	31	17 4 56.27	+ 5.763	− 27 57 28.8	− 6.92	2 26.0
32	15 29 1.69	+ 9.662	− 22 50 15.3	− 45.18	2 44.6	32	17 7 11.35	+ 5.489	− 27 59 58.1	− 5.52	2 24.4

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	10.″0	10.″5	11.″0	11.″6	12.″2	12.″9	Semidiameter . .	13.″7	14.″6	15.″7	16.″8	18.″1	19.″6
Hor. Parallax . .	10.3	10.8	11.4	12.0	12.6	13.4	Hor. Parallax . .	14.2	15.2	16.2	17.4	18.8	20.3

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 7 11.35	+ 5.489	−27 59 58.1	− 5.52	2 24.4
2	17 9 19.71	5.203	28 1 53.9	4.12	2 22.7
3	17 11 21.05	4.905	28 3 16.0	2.72	2 20.7
4	17 13 15.08	4.594	28 4 4.4	− 1.31	2 18.7
5	17 15 1.53	4.271	28 4 19.0	+ 0.10	2 16.4
6	17 16 40.09	+ 3.936	−28 3 59.4	+ 1.53	2 14.1
7	17 18 10.45	3.588	28 3 5.2	2.97	2 11.6
8	17 19 32.30	3.228	28 1 35.9	4.44	2 9.1
9	17 20 45.35	2.855	27 59 31.1	5.93	2 6.4
10	17 21 49.30	2.469	27 56 50.3	7.44	2 3.5
11	17 22 43.87	+ 2.072	−27 53 33.1	+ 8.98	2 0.5
12	17 23 28.77	1.665	27 49 38.8	10.55	1 57.2
13	17 24 3.77	1.247	27 45 6.6	12.14	1 53.8
14	17 24 28.60	0.819	27 39 55.8	13.76	1 50.2
15	17 24 43.03	+ 0.382	27 34 5.6	15.42	1 46.6
16	17 24 46.89	− 0.061	−27 27 35.1	+ 17.12	1 42.7
17	17 24 40.05	0.510	27 20 23.5	18.86	1 38.7
18	17 24 22.40	0.963	27 12 29.6	20.64	1 34.4
19	17 23 53.84	1.417	27 3 52.6	22.45	1 30.0
20	17 23 14.41	1.868	26 54 31.7	24.30	1 25.5
21	17 22 24.20	− 2.314	−26 44 26.2	+ 26.17	1 20.7
22	17 21 23.34	2.753	26 33 35.2	28.08	1 15.8
23	17 20 12.07	3.182	26 21 58.3	30.01	1 10.6
24	17 18 50.69	3.596	26 9 35.3	31.94	1 5.3
25	17 17 19.57	3.991	25 56 25.9	33.86	0 59.8
26	17 15 39.21	− 4.365	−25 42 30.5	+ 35.76	0 54.3
27	17 13 50.17	4.714	25 27 49.9	37.62	0 48.5
28	17 11 53.11	5.033	25 12 25.2	39.42	0 42.6
29	17 9 48.75	5.319	24 56 18.0	41.14	0 36.7
30	17 7 37.93	5.570	24 39 30.4	42.78	0 30.5
31	17 5 21.54	− 5.783	−24 22 5.2	+ 44.29	0 24.3
32	17 3 0.52	− 5.955	−24 4 5.6	+ 45.64	0 18.0

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	21″.2	23″.0	25″.0	27″.1	29″.1	30″.9
Horizontal Parallax	22.0	23.9	25.9	28.1	30.1	32.0

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 5 21.54	− 5.783	−24 22 5.2	+ 44.29	0 24.3
2	17 3 0.52	5.955	24 4 5.6	45.64	0 18.0
3	17 0 35.87	6.085	23 45 35.3	46.83	0 11.7
4	16 58 8.60	6.172	23 26 38.6	47.83	0 5.4 23 59.0
5	16 55 39.78	6.215	23 7 20.1	48.63	23 52.6
6	16 53 10.46	− 6.213	−22 47 45.2	+ 49.20	23 46.2
7	16 50 41.70	6.167	22 27 59.3	49.54	23 39.8
8	16 48 14.57	6.079	22 8 8.3	49.64	23 33.5
9	16 45 50.05	5.950	21 48 18.1	49.48	23 27.3
10	16 43 29.13	5.781	21 28 34.7	49.06	23 21.0
11	16 41 12.72	− 5.574	−21 9 4.3	+ 48.39	23 14.9
12	16 39 1.69	5.333	20 49 52.8	47.48	23 8.9
13	16 36 56.80	5.062	20 31 5.7	46.34	23 3.0
14	16 34 58.79	4.763	20 12 48.5	44.99	22 57.2
15	16 33 8.30	4.437	19 55 6.3	43.44	22 51.6
16	16 31 25.89	− 4.089	−19 38 3.5	+ 41.72	22 46.2
17	16 29 52.08	3.722	19 21 44.2	39.83	22 40.8
18	16 28 27.25	3.341	19 6 12.1	37.80	22 35.6
19	16 27 11.75	2.947	18 51 30.2	35.66	22 30.6
20	16 26 5.83	2.543	18 37 41.0	33.42	22 25.6
21	16 25 9.71	− 2.131	−18 24 46.5	+ 31.10	22 20.9
22	16 24 23.54	1.715	18 12 48.2	28.73	22 16.3
23	16 23 47.39	1.297	18 1 47.0	26.34	22 12.0
24	16 23 21.27	0.879	17 51 43.5	23.94	22 7.8
25	16 23 5.19	0.463	17 42 37.7	21.54	22 3.8
26	16 22 59.04	− 0.050	−17 34 29.3	+ 19.16	21 59.8
27	16 23 2.74	+ 0.358	17 27 17.5	16.82	21 56.1
28	16 23 16.17	0.759	17 21 1.4	14.53	21 52.6
29	16 23 39.13	1.153	17 15 39.7	12.30	21 49.1
30	16 24 11.44	1.538	17 11 10.7	10.14	21 45.9
31	16 24 52.89	+ 1.914	−17 7 32.8	+ 8.05	21 42 8
32	16 25 43.25	+ 2.281	−17 4 44.0	+ 6.04	21 39 8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	32″.0	32″.3	31″.7	30″.4	28″.5	26″.5	24″.4
Hor. Parallax . .	33.1	33.5	32.8	31.5	29.5	27.4	25.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 16 10.76	− 4.217	+27 3 20.3	+ 3.80	11 29.3
2	6 14 30.29	4.151	27 4 46.1	3.36	11 23.7
3	6 12 51.50	4.077	27 6 1.7	2.94	11 18.2
4	6 11 14.56	3.997	27 7 7.5	2.53	11 12.7
5	6 9 39.65	3.909	27 8 3.2	2.13	11 7.2
6	6 8 6.94	− 3.814	+27 8 49.5	+ 1.74	11 1.7
7	6 6 36.58	3.713	27 9 26.7	1.37	10 56.3
8	6 5 8.72	3.606	27 9 55.1	1.01	10 51.0
9	6 3 43.49	3.493	27 10 15.0	0.66	10 45.7
10	6 2 21.04	3.375	27 10 26.9	0.33	10 40.4
11	6 1 1.47	− 3.253	+27 10 31.0	+ 0.02	10 35.1
12	5 59 44.91	3.125	27 10 27.8	− 0.28	10 30.0
13	5 58 31.46	2.993	27 10 17.8	0.55	10 24.8
14	5 57 21.24	2.857	27 10 1.4	0.81	10 19.8
15	5 56 14.33	2.717	27 9 38.9	1.05	10 14.7
16	5 55 10.83	− 2.574	+27 9 10.9	− 1.27	10 9.8
17	5 54 10.79	2.429	27 8 37.8	1.48	10 4.9
18	5 53 14.27	2.281	27 8 0.1	1.67	10 0.1
19	5 52 21.31	2.131	27 7 17.9	1.83	9 55.3
20	5 51 31.97	1.980	27 6 32.0	1.98	9 50.5
21	5 50 46.28	− 1.827	+27 5 42.5	− 2.12	9 45.9
22	5 50 4.27	1.673	27 4 50.0	2.25	9 41.3
23	5 49 25.96	1.519	27 3 54.7	2.35	9 36.7
24	5 48 51.35	1.365	27 2 57.0	2.45	9 32.2
25	5 48 20.43	1.212	27 1 57.2	2.53	9 27.8
26	5 47 53.18	− 1.059	+27 0 55.7	− 2.60	9 23.4
27	5 47 29.59	0.908	26 59 52.6	2.65	9 19.1
28	5 47 9.62	0.757	26 58 48.4	2.69	9 14.9
29	5 46 53.25	0.607	26 57 43.2	2.73	9 10.7
30	5 46 40.45	0.459	26 56 37.2	2.76	9 6.6
31	5 46 31.18	− 0.313	+26 55 30.6	− 2.78	9 2.6
32	5 46 25.39	− 0.170	+26 54 23.6	− 2.80	8 58.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	8″.2	8″.0	7″.8	7″.5	7″.2	6″.9	6″.6
Hor. Parallax . .	14.4	14.0	13.6	13.1	12.6	12.1	11.5

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 46 25.39	− 0.170	+26 54 23.6	− 2.80	8 58.6
2	5 46 23.03	− 0.028	26 53 16.3	2.81	8 54.6
3	5 46 24.06	+ 0.112	26 52 8.8	2.81	8 50.7
4	5 46 28.42	0.250	26 51 1.3	2.81	8 46.9
5	5 46 36.07	0.386	26 49 53.7	2.81	8 43.1
6	5 46 46.94	+ 0.519	+26 48 46.3	− 2.81	8 39.4
7	5 47 1.00	0.651	26 47 38.9	2.80	8 35.7
8	5 47 18.19	0.781	26 46 31.6	2.80	8 32.1
9	5 47 38.47	0.908	26 45 24.5	2.80	8 28.5
10	5 48 1.77	1.033	26 44 17.5	2.79	8 25.0
11	5 48 28.05	+ 1.156	+26 43 10.5	− 2.79	8 21.5
12	5 48 57.27	1.277	26 42 3.6	2.79	8 18.0
13	5 49 29.37	1.397	26 40 56.6	2.79	8 14.6
14	5 50 4.30	1.513	26 39 49.6	2.80	8 11.3
15	5 50 42.01	1.628	26 38 42.4	2.80	8 8.0
16	5 51 22.45	+ 1.741	+26 37 35.1	− 2.81	8 4.8
17	5 52 5.57	1.851	26 36 27.5	2.83	8 1.6
18	5 52 51 31	1.959	26 35 19.4	2.85	7 58.4
19	5 53 39.63	2.065	26 34 10.9	2.87	7 55.3
20	5 54 30.46	2 170	26 33 1.7	2.90	7 52.2
21	5 55 23.75	+ 2.271	+26 31 51.9	− 2.93	7 49.2
22	5 56 19.45	2.370	26 30 41.2	2.96	7 46.2
23	5 57 17.50	2.466	26 29 29.6	3.00	7 43.2
24	5 58 17.84	2.561	26 28 17.0	3.05	7 40.3
25	5 59 20.41	2.652	26 27 3.2	3.10	7 37.4
26	6 0 25.16	+ 2.741	+26 25 48.1	− 3.16	7 34.6
27	6 1 32.04	2.829	26 24 31.6	3.22	7 31.8
28	6 2 40.98	2.915	26 23 13.6	3.29	7 29.0
29	6 3 51.94	2.997	26 21 53.8	3.36	7 26.2
30	6 5 4.86	3 078	26 20 32.1	3.44	7 23.5
31	6 6 19.69	+ 3.156	+26 19 8.5	− 3.53	7 20.8
32	6 7 36.37	+ 3.232	+26 17 42.7	− 3.62	7 18.2

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter	6″.3	6″.0	5″.7	5″.4	5″.1
Horizontal Parallax . .	11.0	10.5	10.0	9.5	9.0

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 3 51.94	+ 2.997	+26 21 53.8	− 3.36	7 26.2	1	6 53 19.86	+ 4.746	+25 13 38.3	− 8.49	6 13.8
2	6 5 4.86	3.078	26 20 32.1	3.44	7 23.5	2	6 55 14.20	4.781	25 10 11.5	8.73	6 11.8
3	6 6 19.69	3.156	26 19 8.5	3.53	7 20.8	3	6 57 9.36	4.814	25 6 38.9	8.98	6 9.8
4	6 7 36.37	3.232	26 17 42.7	3.62	7 18.2	4	6 59 5.33	4.847	25 3 0.4	9.23	6 7.8
5	6 8 54.86	3.307	26 16 14.7	3.72	7 15.6	5	7 1 2.05	4.879	24 59 16.0	9.48	6 5.8
6	6 10 15.10	+ 3.379	+26 14 44.3	− 3.82	7 13.0	6	7 2 59.52	+ 4.910	+24 55 25.4	− 9.73	6 3.8
7	6 11 37.06	3.449	26 13 11.3	3.93	7 10.4	7	7 4 57.72	4.939	24 51 28.8	9.99	6 1.8
8	6 13 0.70	3.519	26 11 35.6	4.05	7 7.9	8	7 6 56.62	4.968	24 47 25.9	10.25	5 59.9
9	6 14 25.98	3.587	26 9 56.9	4.17	7 5.4	9	7 8 56.20	4.996	24 43 16.6	10.52	5 57.9
10	6 15 52.86	3.653	26 8 15.2	4.30	7 2.9	10	7 10 56.45	5.024	24 39 0.9	10.79	5 56.0
11	6 17 21.31	+ 3.717	+26 6 30.5	− 4.44	7 0.4	11	7 12 57.36	+ 5.051	+24 34 38.8	− 11.06	5 54.1
12	6 18 51.29	3.780	26 4 42.3	4.59	6 58.0	12	7 14 58.91	5.077	24 30 10.1	11.33	5 52.2
13	6 20 22.77	3.841	26 2 50.6	4.74	6 55.6	13	7 17 1.08	5.102	24 25 34.8	11.61	5 50.3
14	6 21 55.70	3.902	26 0 55.4	4.89	6 53.2	14	7 19 3.85	5.127	24 20 53.0	11.88	5 48.4
15	6 23 30.06	3.961	25 58 56.4	5.04	6 50.9	15	7 21 7.19	5.151	24 16 4.4	12.16	5 46.5
16	6 25 5.80	+ 4.018	+25 56 53.5	− 5.20	6 48.5	16	7 23 11.10	+ 5.174	+24 11 9.0	− 12.45	5 44.6
17	6 26 42.91	4.073	25 54 46.6	5.37	6 46.2	17	7 25 15.56	5.196	24 6 6.9	12.73	5 42.8
18	6 28 21.34	4.128	25 52 35.5	5.55	6 43.9	18	7 27 20.55	5.218	24 0 58.0	13.02	5 40.9
19	6 30 1.06	4.181	25 50 20.0	5.73	6 41.7	19	7 29 26.04	5.239	23 55 42.1	13.30	5 39.0
20	6 31 42.03	4.232	25 48 0.2	5.92	6 39.4	20	7 31 32.03	5.259	23 50 19.3	13.59	5 37.2
21	6 33 24.23	+ 4.283	+25 45 35.8	− 6.11	6 37.2	21	7 33 38.50	+ 5.279	+23 44 49.6	− 13.88	5 35.4
22	6 35 7.62	4.332	25 43 6.8	6.31	6 35.0	22	7 35 45.42	5.298	23 39 12.9	14.18	5 33.5
23	6 36 52.18	4.380	25 40 33.0	6.51	6 32.8	23	7 37 52.78	5.315	23 33 29.2	14.46	5 31.7
24	6 38 37.87	4.427	25 37 54.4	6.71	6 30.6	24	7 40 0.56	5.332	23 27 38.5	14.75	5 29.9
25	6 40 24.66	4.471	25 35 10.9	6.92	6 28.5	25	7 42 8.74	5.348	23 21 40.8	15.05	5 28.1
26	6 42 12.49	+ 4.514	+25 32 22.3	− 7.13	6 26.3	26	7 44 17.30	+ 5.364	+23 15 36.0	− 15.35	5 26.3
27	6 44 1.35	4.556	25 29 28.5	7.35	6 24.2	27	7 46 26.21	5.379	23 9 24.1	15.64	5 24.5
28	6 45 51.20	4.596	25 26 29.4	7.57	6 22.1	28	7 48 35.47	5.393	23 3 5.2	15.93	5 22.8
29	6 47 42.00	4.636	25 23 24.9	7.80	6 20.0	29	7 50 45.06	5.406	22 56 39.2	16.23	5 21.0
30	6 49 33.73	4.674	25 20 14.9	8.03	6 17.9	30	7 52 54.96	5.419	22 50 6.0	16.53	5 19.2
31	6 51 26.36	+ 4.711	+25 16 59.4	− 8.26	6 15.9	31	7 55 5.17	+ 5.431	+22 43 25.8	− 16.82	5 17.4
32	6 53 19.86	+ 4.746	+25 13 38.3	− 8.49	6 13.8	32	7 57 15.67	+ 5.443	+22 36 38.5	− 17.11	5 15.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	4″.9	4″.7	4″.5	4″.3	4″.1	4″.0	Semidiameter . .	3″.8	3″.7	3″.6	3″.5	3″.3	3″.2
Hor. Parallax . .	8.6	8.3	7.9	7.6	7.2	7.0	Hor. Parallax . .	6.7	6.5	6.2	6.0	5.9	5.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 55 5.17	+ 5.431	+ 22 43 25.8	− 16.82	5 17.4
2	7 57 15.67	5.443	22 36 38.5	17.11	5 15.7
3	7 59 26.44	5.454	22 29 44.1	17.41	5 13.9
4	8 1 37.48	5.465	22 22 42.6	17.71	5 12.2
5	8 3 48.77	5.475	22 15 34.0	18.01	5 10.4
6	8 6 0.31	+ 5.485	+ 22 8 18.1	− 18.31	5 8.7
7	8 8 12.08	5.495	22 0 54.9	18.61	5 6.9
8	8 10 24.07	5.504	21 53 24.7	18.91	5 5.2
9	8 12 36.28	5.513	21 45 47.2	19.21	5 3.4
10	8 14 48.70	5.522	21 38 2.6	19.50	5 1.7
11	8 17 1.33	+ 5.530	+ 21 30 10.9	− 19.80	5 0.0
12	8 19 14.15	5.538	21 22 12.0	20.10	4 58.3
13	8 21 27.16	5.546	21 14 5.9	20.40	4 56.5
14	8 23 40.36	5.554	21 5 52.5	20.70	4 54.8
15	8 25 53.73	5.561	20 57 32.0	21.00	4 53.1
16	8 28 7.25	+ 5.567	+ 20 49 4.3	− 21.30	4 51.4
17	8 30 20.94	5.573	20 40 29.6	21.60	4 49.7
18	8 32 34.78	5.579	20 31 47.8	21.89	4 48.0
19	8 34 48.75	5.585	20 22 58.9	22.18	4 46.3
20	8 37 2.86	5.590	20 14 2.9	22.48	4 44.5
21	8 39 17.08	+ 5.594	+ 20 4 59.9	− 22.77	4 42.8
22	8 41 31.42	5.598	19 55 50.1	23.06	4 41.1
23	8 43 45.85	5.602	19 46 33.3	23.34	4 39.4
24	8 46 0.37	5.606	19 37 9.6	23.63	4 37.7
25	8 48 14.98	5.610	19 27 39.1	23.91	4 36.0
26	8 50 29.68	+ 5.613	+ 19 18 1.8	− 24.19	4 34.3
27	8 52 44.43	5.616	19 8 17.7	24.47	4 32.7
28	8 54 59.24	5.618	18 58 27.0	24.75	4 31.0
29	8 57 14.10	5.620	18 48 29.6	25.03	4 29.3
30	8 59 29.01	5.622	18 38 25.6	25.31	4 27.6
31	9 1 43.96	+ 5.624	+ 18 28 14.9	− 25.58	4 25.9
32	9 3 58.95	+ 5.625	+ 18 17 57.6	− 25.85	4 24 2

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 3 58.95	+ 5.625	+ 18 17 57.6	− 25.85	4 24.2
2	9 6 13.98	5.627	18 7 33.8	26.12	4 22.5
3	9 8 29.05	5.628	17 57 3.5	26.39	4 20.8
4	9 10 44.15	5.629	17 46 26.8	26.66	4 19.1
5	9 12 59.27	5.630	17 35 43.8	26.92	4 17.4
6	9 15 14.42	+ 5.632	+ 17 24 54.2	− 27.19	4 15.7
7	9 17 29.60	5.633	17 13 58.2	27.46	4 14.1
8	9 19 44.80	5.634	17 2 55.9	27.73	4 12.4
9	9 22 0.03	5.635	16 51 47.4	27.99	4 10.7
10	9 24 15.29	5.636	16 40 32.6	28.24	4 9.0
11	9 26 30.57	+ 5.637	+ 16 29 11.6	− 28.50	4 7.3
12	9 28 45.88	5.638	16 17 44.4	28.76	4 5.6
13	9 31 1.20	5.638	16 6 11.2	29.01	4 4.0
14	9 33 16.54	5.639	15 54 31.8	29.26	4 2.3
15	9 35 31.89	5.640	15 42 46.5	29.51	4 0.6
16	9 37 47.26	+ 5.641	+ 15 30 55.2	− 29.76	3 58.9
17	9 40 2.65	5.641	15 18 58.0	30.00	3 57.2
18	9 42 18.05	5.641	15 6 55.0	30.24	3 55.5
19	9 44 33.46	5.642	14 54 46.3	30.48	3 53.8
20	9 46 48.88	5.642	14 42 32.0	30.71	3 52.2
21	9 49 4.29	+ 5.642	+ 14 30 12.1	− 30.94	3 50.5
22	9 51 19.71	5.642	14 17 46.7	31.17	3 48.8
23	9 53 35.12	5.642	14 5 15.8	31.40	3 47.1
24	9 55 50.53	5.641	13 52 39.5	31.63	3 45.4
25	9 58 5.92	5.641	13 39 57.8	31.85	3 43.7
26	10 0 21.31	+ 5.641	+ 13 27 10.9	− 32.06	3 42.0
27	10 2 36.68	5.640	13 14 18.9	32.27	3 40.4
28	10 4 52.06	5.640	13 1 21.7	32.48	3 38.7
29	10 7 7.43	5.640	12 48 19.5	32.70	3 37.0
30	10 9 22.80	5.640	12 35 12.1	32.92	3 35.3
31	10 11 38.16	+ 5.640	+ 12 21 59.7	− 33.12	3 33.6
32	10 13 53.52	+ 5.640	+ 12 8 42.6	− 33.31	3 32.0

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	3″.1	3″.1	3″.0	2″.9	2″.8	2″.8	2″.7
Hor. Parallax . .	5.5	5.4	5.2	5.1	5.0	4.9	4.7

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	2″.7	2″.6	2″.6	2″.5	2″.5	2″.4
Hor. Parallax . .	4.7	4.6	4.5	4.4	4.3	4.2

Note.– The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 11 38.16	+ 5.640	+ 12 21 59.7	− 33.12	3 33.6	1	11 21 48.79	+ 5.697	+ 4 57 29.9	− 38.08	2 41.6
2	10 13 53.52	5.640	12 8 42.6	33.31	3 32.0	2	11 24 5.57	5.701	4 42 14.7	38.18	2 40.0
3	10 16 8.87	5.640	11 55 20.6	33.51	3 30.3	3	11 26 22.45	5.705	4 26 56.9	38.29	2 38.3
4	10 18 24.24	5.640	11 41 53.8	33.71	3 28.6	4	11 28 39.45	5.710	4 11 36.6	38.39	2 36.7
5	10 20 39.61	5.641	11 28 22.2	33.91	3 26.9	5	11 30 56.57	5.716	3 56 13.9	38.49	2 35.0
6	10 22 55.00	+ 5.641	+ 11 14 45.9	− 34.11	3 25.2	6	11 33 13.82	+ 5.721	+ 3 40 48.8	− 38.59	2 33.4
7	10 25 10.40	5.642	11 1 5.0	34.30	3 23.5	7	11 35 31.20	5.726	3 25 21.4	38.69	2 31.7
8	10 27 25.82	5.643	10 47 19.5	34.48	3 21.8	8	11 37 48.71	5.732	3 9 51.8	38.78	2 30.1
9	10 29 41.28	5.644	10 33 29.6	34.67	3 20.2	9	11 40 6.36	5.738	2 54 20.1	38.87	2 28.4
10	10 31 56.76	5.646	10 19 35.1	34.86	3 18.5	10	11 42 24.16	5.745	2 38 46.2	38.95	2 26.8
11	10 34 12.26	+ 5.647	+ 10 5 36.3	− 35.04	3 16.8	11	11 44 42.12	+ 5.752	+ 2 23 10.4	− 39.03	2 25.1
12	10 36 27.79	5.648	9 51 33.2	35.22	3 15.1	12	11 47 0.24	5.758	2 7 32.7	39.11	2 23.5
13	10 38 43.36	5.650	9 37 25.9	35.39	3 13.4	13	11 49 18.53	5.765	1 51 53.3	39.18	2 21.8
14	10 40 58.97	5.651	9 23 14.4	35.57	3 11.8	14	11 51 36.98	5.772	1 36 12.2	39.25	2 20.2
15	10 43 14.62	5.653	9 8 58.8	35.73	3 10.1	15	11 53 55.60	5.780	1 20 29.5	39.31	2 18.6
16	10 45 30.32	+ 5.655	+ 8 54 39.3	− 35.89	3 8.4	16	11 56 14.40	+ 5.787	+ 1 4 45.3	− 39.37	2 17.0
17	10 47 46.06	5.657	8 40 15.8	36.06	3 6.7	17	11 58 33.39	5.795	0 48 59.7	39.42	2 15.3
18	10 50 1.84	5.659	8 25 48.5	36.21	3 5.0	18	12 0 52.56	5.803	0 33 12.9	39.47	2 13.7
19	10 52 17.67	5.661	8 11 17.4	36 37	3 3.4	19	12 3 11.92	5.811	0 17 24.8	39 52	2 12.1
20	10 54 33.55	5.663	7 56 42.7	36.52	3 1.7	20	12 5 31.46	5.818	+ 0 1 35.6	39.56	2 10.5
21	10 56 49.48	+ 5.665	+ 7 42 4.4	− 36.67	3 0.0	21	12 7 51.20	+ 5.826	− 0 14 14.5	− 39.60	2 8.9
22	10 59 5.46	5.667	7 27 22.6	36.81	2 58.3	22	12 10 11.14	5.835	0 30 5.5	39.64	2 7.3
23	11 1 21.50	5.670	7 12 37.4	36.95	2 56.7	23	12 12 31.29	5.844	0 45 57.3	39.67	2 5.7
24	11 3 37.59	5.672	6 57 48.9	37.09	2 55.0	24	12 14 51.66	5.853	1 1 49.7	39.70	2 4.1
25	11 5 53.74	5.674	6 42 57.2	37.22	2 53.3	25	12 17 12.25	5.862	1 17 42.9	39.72	2 2.5
26	11 8 9.95	+ 5.677	+ 6 28 2.2	− 37.35	2 51.7	26	12 19 33.07	+ 5.872	− 1 33 36.6	− 39.74	2 0.9
27	11 10 26.23	5.680	6 13 4.1	37.48	2 50.0	27	12 21 54.12	5.882	1 49 30.6	39.75	1 59.3
28	11 12 42.58	5.683	5 58 3.0	37.61	2 48.3	28	12 24 15.40	5.892	2 5 24.9	39.76	1 57.7
29	11 14 59.00	5.686	5 42 58.9	37.73	2 46.7	29	12 26 36.94	5.903	2 21 19.6	39.77	1 56.1
30	11 17 15.51	5.689	5 27 52.0	37.85	2 45.0	30	12 28 58.72	5.913	2 37 14.3	39.78	1 54.5
31	11 19 32.10	+ 5.693	+ 5 12 42.4	− 37.96	2 43.3	31	12 31 20.77	+ 5.924	− 2 53 9.1	− 39.78	1 53.0
32	11 21 48.79	+ 5.697	+ 4 57 29.9	− 38.08	2 41.6	32	12 33 43 09	+ 5 936	− 3 9 4.0	− 39.78	1 51.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	2″.4	2″.4	2″.3	2″.3	2″.3	2″.2	Semidiameter . .	2″.2	2″.2	2″.2	2″.2	2″.1	2″.1
Hor. Parallax . .	4.2	4.1	4.1	4.0	4.0	3.9	Hor. Parallax . .	3.9	3.8	3.8	3.8	3.7	3.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	12 33 43.09	+ 5.936	− 3 9 4.0	− 39.78	1 51.4
2	12 36 5.68	5.947	3 24 58.6	39.77	1 49.8
3	12 38 28.56	5.959	3 40 53.0	39.76	1 48.3
4	12 40 51.74	5.972	3 56 47.1	39.74	1 46.7
5	12 43 15.23	5.985	4 12 40.8	39.72	1 45.2
6	12 45 39.03	+ 5.998	− 4 28 34.0	− 39.70	1 43.6
7	12 48 3.14	6.011	4 44 26.5	39.67	1 42.1
8	12 50 27.57	6.025	5 0 18.2	39.63	1 40.6
9	12 52 52.33	6.039	5 16 9.1	39.59	1 39.0
10	12 55 17.44	6.053	5 31 59.0	39.55	1 37.5
11	12 57 42.88	+ 6.067	− 5 47 47.9	− 39.50	1 36.0
12	13 0 8.68	6.082	6 3 35.6	39.45	1 34.5
13	13 2 34.83	6.097	6 19 21.9	39.39	1 33.0
14	13 5 1.34	6.112	6 35 6.8	39.34	1 31.5
15	13 7 28.21	6.127	6 50 50.1	39.27	1 30.0
16	13 9 55.46	+ 6.143	− 7 6 31.7	− 39.20	1 28.5
17	13 12 23.08	6.159	7 22 11.4	39.12	1 27.0
18	13 14 51.07	6.175	7 37 49.3	39.03	1 25.5
19	13 17 19.45	6.190	7 53 25.0	38.94	1 24.1
20	13 19 48.22	6.206	8 8 58.5	38.85	1 22.6
21	13 22 17.39	+ 6.223	− 8 24 29.8	− 38.75	1 21.2
22	13 24 46.96	6.240	8 39 58.6	38.64	1 19.7
23	13 27 16.93	6.258	8 55 24.8	38.53	1 18.3
24	13 29 47.33	6.275	9 10 48.3	38.41	1 16.8
25	13 32 18.14	6.293	9 26 8.9	38.29	1 15.4
26	13 34 49.38	+ 6.311	− 9 41 26.7	− 38.17	1 14.0
27	13 37 21.06	6.329	9 56 41.4	38.05	1 12.6
28	13 39 53.20	6.348	10 11 52.9	37.92	1 11.2
29	13 42 25.79	6.367	10 27 1.2	37.77	1 9.8
30	13 44 58.84	6.386	10 42 6.0	37.63	1 8.4
31	13 47 32.35	+ 6.407	− 10 57 7.3	− 37.48	1 7.0
32	13 50 6.34	+ 6.427	− 11 12 4.8	− 37.32	1 5.6

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	2″.1	2″.1	2″.1	2″.1	2″.1	2″.1
Hor. Parallax . .	3.7	3.7	3.6	3.6	3.6	3.6

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 47 32.35	+ 6.407	− 10 57 7.3	− 37.48	1 7.0
2	13 50 6.34	6.427	11 12 4.8	37.32	1 5.6
3	13 52 40.82	6.447	11 26 58.5	37.15	1 4.3
4	13 55 15.79	6.467	11 41 48.3	36.98	1 2.9
5	13 57 51 26	6.488	11 56 34.0	36.82	1 1.6
6	14 0 27.24	+ 6.510	− 12 11 15.5	− 36.64	1 0.2
7	14 3 3.73	6 532	12 25 52.7	36.45	0 58.9
8	14 5 40.74	6.553	12 40 25.2	36.26	0 57.5
9	14 8 18.26	6.575	12 54 53.2	36.06	0 56.2
10	14 10 56.32	6.597	13 9 16.3	35.86	0 54.9
11	14 13 34.91	+ 6.619	− 13 23 34.5	− 35.65	0 53.6
12	14 16 14.04	6.642	13 37 47.5	35.43	0 52.4
13	14 18 53.72	6.665	13 51 55.3	35.21	0 51.1
14	14 21 33.94	6.687	14 5 57.7	34.98	0 49.8
15	14 24 14.70	6.709	14 19 54.5	34.74	0 48.5
16	14 26 56.01	+ 6.732	− 14 33 45.5	− 34.50	0 47.3
17	14 29 37.87	6 756	14 47 30.8	34.26	0 46.0
18	14 32 20.29	6.779	15 1 9.9	34.00	0 44.8
19	14 35 3.28	6 803	15 14 42.8	33.74	0 43.6
20	14 37 46.82	6.826	15 28 9.4	33.47	0 42.4
21	14 40 30.93	+ 6.849	− 15 41 29.3	− 33.19	0 41.2
22	14 43 15.61	6.873	15 54 42.7	32.92	0 40.0
23	14 46 0.86	6.898	16 7 49.2	32.63	0 38.8
24	14 48 46.70	6.922	16 20 48 8	32.33	0 37.6
25	14 51 33.11	6.946	16 33 41.2	32.03	0 36.4
26	14 54 20.12	+ 6.971	− 16 46 26.3	− 31.73	0 35.3
27	14 57 7.72	6.996	16 59 4.0	31.41	0 34.1
28	14 59 55.92	7.021	17 11 34.1	31.09	0 33.0
29	15 2 44.72	7.046	17 23 56.3	30.76	0 31.9
30	15 5 34.13	7.071	17 36 10.7	30.43	0 30.7
31	15 8 24.15	+ 7.096	− 17 48 17.0	− 30.09	0 29.6
32	15 11 14.78	+ 7.122	− 18 0 15.0	− 29.74	0 28.5

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	2″.1	2″.0	2″.0	2″.0	2″.0	2″.0
Hor. Parallax . .	3.6	3.6	3.6	3.6	3.6	3.6

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	15 11 14.78	+ 7.122	− 18 0 15.0	− 29.74	0 28.5
2	15 14 6.03	7.148	18 12 4.7	29.39	0 27.4
3	15 16 57.90	7.174	18 23 45.7	29.03	0 26.4
4	15 19 50.40	7.200	18 35 18.0	28.66	0 25.3
5	15 22 43.52	7.226	18 46 41.4	28.29	0 24.2
6	15 25 37.26	+ 7.252	− 18 57 55.8	− 27.91	0 23.2
7	15 28 31.62	7.278	19 9 0.9	27.52	0 22.2
8	15 31 26.60	7.304	19 19 56.7	27.12	0 21.1
9	15 34 22.20	7.329	19 30 42.8	26.72	0 20.1
10	15 37 18.42	7.355	19 41 19.3	26.31	0 19.1
11	15 40 15.26	+ 7.381	− 19 51 45.8	− 25.89	0 18.1
12	15 43 12.71	7.406	20 2 2.1	25.47	0 17.1
13	15 46 10.76	7.431	20 12 8.1	25.03	0 16.2
14	15 49 9.41	7.456	20 22 3.8	24.99	0 15.2
15	15 52 8.67	7.481	20 31 48.9	24.15	0 14.2
16	15 55 8.53	+ 7.507	− 20 41 23.2	− 23.70	0 13.3
17	15 58 8.99	7.532	20 50 46.6	23.24	0 12.4
18	16 1 10.04	7.556	20 59 59.0	22.78	0 11.4
19	16 4 11.67	7.580	21 9 0.0	22.31	0 10.5
20	16 7 13.88	7.604	21 17 49.7	21.83	0 9.6
21	16 10 16.67	+ 7.628	− 21 26 27.8	− 21.34	0 8.7
22	16 13 20.04	7.652	21 34 54.1	20.85	0 7.8
23	16 16 23.98	7.676	21 43 8.6	20.35	0 7.0
24	16 19 28.48	7.699	21 51 11.1	19.85	0 6.1
25	16 22 33.56	7.723	21 59 1.3	19.34	0 5.2
26	16 25 39.20	+ 7.746	− 22 6 39.3	− 18.82	0 4.4
27	16 28 45.39	7.769	22 14 4.7	18.29	0 3.6
28	16 31 52.12	7.792	22 21 17.5	17.76	0 2.7
29	16 34 59.41	7.814	22 28 17.5	17.23	0 1.9
30	16 38 7.23	7.837	22 35 4.7	16.69	0 1.1
31	16 41 15.59	+ 7.859	− 22 41 38.8	− 16.14	{ 0 0.3 { 23 59.5
32	16 44 24.48	+ 7.881	− 22 47 59.5	− 15.59	23 58.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	2.0″	2.0″	2.0″	2.0″	2.0″	2.0″
Horizontal Parallax	3.6	3.6	3.6	3.6	3.6	3.6

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	16 41 15.59	+ 7.859	− 22 41 38.8	− 16.14	{ 0 0.3 { 23 59.5
2	16 44 24.48	7.881	22 47 59.5	15.59	23 58.7
3	16 47 33.89	7.902	22 54 6.9	15.03	23 57.9
4	16 50 43.79	7.923	23 0 0.9	14.46	23 57.2
5	16 53 54.20	7.943	23 5 41.2	13.89	23 56.4
6	16 57 5.10	+ 7.963	− 23 11 7.8	− 13.31	23 55.7
7	17 0 16.47	7.983	23 16 20.4	12.73	23 54.9
8	17 3 28.32	8.003	23 21 19.1	12.14	23 54.2
9	17 6 40.62	8.022	23 26 3.6	11.55	23 53.4
10	17 9 53.37	8.040	23 30 33.8	10.96	23 52.7
11	17 13 6.54	+ 8.058	− 23 34 49.6	− 10.36	23 52.0
12	17 16 20.13	8.074	23 38 51.0	9.75	23 51.3
13	17 19 34.11	8.090	23 42 37.7	9.14	23 50.6
14	17 22 48.49	8.107	23 46 9.8	8.52	23 49.9
15	17 26 3.24	8.122	23 49 27.1	7.90	23 49.2
16	17 29 18.35	+ 8.137	− 23 52 29.4	− 7.28	23 48.5
17	17 32 33.82	8.151	23 55 16.8	6.66	23 47.8
18	17 35 49.61	8.165	23 57 49.0	6.02	23 47.2
19	17 39 5.71	8.177	24 0 6.0	5.39	23 46.5
20	17 42 22.12	8.189	24 2 7.7	4.75	23 45.8
21	17 45 38.82	+ 8.201	− 24 3 54.1	− 4.11	23 45.2
22	17 48 55.81	8.213	24 5 25.1	3.47	23 44.5
23	17 52 13.06	8.224	24 6 40.6	2.82	23 43.9
24	17 55 30.57	8.234	24 7 40.6	2.17	23 43.2
25	17 58 48.33	8.244	24 8 24.9	1.52	23 42.6
26	18 2 6.32	+ 8.254	− 24 8 53.5	− 0.86	23 41.9
27	18 5 24.52	8.263	24 9 6.4	− 0.21	23 41.3
28	18 8 42.93	8.271	24 9 3.5	+ 0.45	23 40.7
29	18 12 1.52	8.279	24 8 44.8	1.11	23 40.1
30	18 15 20.29	8.286	24 8 10.1	1.78	23 39.4
31	18 18 39.22	+ 8.292	− 24 7 19.6	+ 2.44	23 38.8
32	18 21 58.29	+ 8.298	− 24 6 13.1	+ 3.10	23 38.2

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	2.0″	2.1″	2.1″	2.1″	2.1″	2.1″
Horizontal Parallax .	3.6	3.6	3.6	3.6	3.6	3.6

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	2 56 43.91	− 0.319	+ 15 44 36.0	− 0.62	8 11.2	1	2 59 19.26	+ 0.720	+ 16 4 51.2	+ 3.75	6 12.0
2	2 56 36.66	0.285	15 44 22.8	0.47	8 7.1	2	2 59 36.91	0.751	16 6 22.9	3.87	6 8.4
3	2 56 30.23	0.250	15 44 13.1	0.32	8 3.1	3	2 59 55.29	0.781	16 7 57.5	3.99	6 4.8
4	2 56 24.62	0.216	15 44 7.0	0.18	7 59.1	4	3 0 14.40	0.811	16 9 34.8	4.11	6 1.2
5	2 56 19.84	0.182	15 44 4.5	− 0.03	7 55.1	5	3 0 34.23	0.841	16 11 15.0	4.23	5 57.6
6	2 56 15.88	− 0.148	+ 15 44 5.5	+ 0.12	7 51.1	6	3 0 54.77	+ 0.871	+ 16 12 58.0	+ 4.35	5 54.0
7	2 56 12.75	0.114	15 44 10.1	0.27	7 47.1	7	3 1 16.02	0.900	16 14 43.7	4.46	5 50.4
8	2 56 10.44	0.080	15 44 18.2	0.42	7 43.1	8	3 1 37.96	0.929	16 16 32.0	4.57	5 46.8
9	2 56 8.96	0.045	15 44 29.9	0.56	7 39.1	9	3 2 0.60	0.958	16 18 23.0	4.68	5 43.3
10	2 56 8.30	− 0.010	15 44 45.2	0.71	7 35.2	10	3 2 23.94	0.987	16 20 16.6	4.79	5 39.7
11	2 56 8.46	+ 0.024	+ 15 45 4.0	+ 0.86	7 31.3	11	3 2 47.96	+ 1.015	+ 16 22 12.8	+ 4.89	5 36.2
12	2 56 9.45	0.058	15 45 26.4	1.00	7 27.4	12	3 3 12.66	1.043	16 24 11.4	4.99	5 32.7
13	2 56 11.27	0.092	15 45 52.3	1.15	7 23.5	13	3 3 38.03	1.071	16 26 12.5	5.09	5 29.2
14	2 56 13.91	0.126	15 46 21.8	1.30	7 19.6	14	3 4 4.07	1.099	16 28 16.0	5.19	5 25.7
15	2 56 17.37	0.160	15 46 54.8	1.45	7 15.7	15	3 4 30.77	1.126	16 30 21.8	5.29	5 22.2
16	2 56 21.65	+ 0.195	+ 15 47 31.4	+ 1.60	7 11.9	16	3 4 58.13	+ 1.153	+ 16 32 30.0	+ 5.38	5 18.7
17	2 56 26.75	0.229	15 48 11.4	1.75	7 8.0	17	3 5 26.12	1.180	16 34 40.4	5.47	5 15.2
18	2 56 32.67	0.263	15 48 54.9	1.89	7 4.2	18	3 5 54.75	1.206	16 36 53.0	5.56	5 11.7
19	2 56 39.41	0.297	15 49 41.8	2.03	7 0.4	19	3 6 24.01	1.232	16 39 7.7	5.65	5 8.3
20	2 56 46.96	0.331	15 50 32.1	2.17	6 56.6	20	3 6 53.89	1.258	16 41 24.5	5.74	5 4.9
21	2 56 55.32	+ 0.365	+ 15 51 25.8	+ 2.31	6 52.8	21	3 7 24.39	+ 1.283	+ 16 43 43.4	+ 5.83	5 1.5
22	2 57 4.49	0.399	15 52 22.9	2.45	6 49.0	22	3 7 55.50	1.308	16 46 4.3	5.91	4 58.1
23	2 57 14.46	0.432	15 53 23.3	2.59	6 45.2	23	3 8 27.21	1.333	16 48 27.1	5.99	4 54.7
24	2 57 25.22	0.465	15 54 27.1	2.73	6 41.5	24	3 8 59.51	1.358	16 50 51.9	6.07	4 51.3
25	2 57 36.77	0.498	15 55 34.1	2.86	6 37.8	25	3 9 32.40	1.382	16 53 18.5	6.15	4 47.9
26	2 57 49.12	+ 0.531	+ 15 56 44.3	+ 2.99	6 34.1	26	3 10 5.86	+ 1.406	+ 16 55 46.9	+ 6.22	4 44.5
27	2 58 2.24	0.563	15 57 57.8	3.12	6 30.4	27	3 10 39.89	1.429	16 58 17.0	6.29	4 41.1
28	2 58 16.12	0.595	15 59 14.4	3.25	6 26.7	28	3 11 14.48	1.452	17 0 48.8	6.36	4 37.7
29	2 58 30.77	0.627	16 0 34.1	3.38	6 23.0	29	3 11 49.61	1.475	17 3 22.3	6.43	4 34.4
30	2 58 46.18	0.658	16 1 56.8	3.51	6 19.3	30	3 12 25.29	1.498	17 5 57.3	6.49	4 31.0
31	2 59 2.35	+ 0.689	+ 16 3 22.5	+ 3.63	6 15.6	31	3 13 1.50	+ 1.520	+ 17 8 33.8	+ 6.55	4 27.7
32	2 59 19.26	+ 0.720	+ 16 4 51.2	+ 3.75	6 12.0	32	3 13 38.25	+ 1.542	+ 17 11 11.8	+ 6.61	4 24.4

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	21″.5	20″.8	20″.2	19″.5	Polar Semidiameter . .	19″.4	18″.8	18″.2	17″.7
Horizontal Parallax . .	2.0	2.0	1.9	1.8	Horizontal Parallax . .	1.8	1.8	1.7	1.7

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	3 11 49.61	+ 1.475	+ 17 3 22.3	+ 6.43	4 34.4
2	3 12 25.29	1.498	17 5 57.3	6.49	4 31.0
3	3 13 1.50	1.520	17 8 33.8	6.55	4 27.7
4	3 13 38.25	1.542	17 11 11.8	6.61	4 24.4
5	3 14 15.52	1.564	17 13 51.2	6.67	4 21.1
6	3 14 53.30	+ 1.585	+ 17 16 32.0	+ 6.73	4 17.8
7	3 15 31.60	1.606	17 19 14.1	6.78	4 14.5
8	3 16 10.40	1.627	17 21 57.5	6.83	4 11.2
9	3 16 49.69	1.647	17 24 42.1	6.88	4 7.9
10	3 17 29.47	1.667	17 27 27.9	6.93	4 4.6
11	3 18 9.73	+ 1.687	+ 17 30 14.9	+ 6.98	4 1.3
12	3 18 50.47	1.707	17 33 3.0	7.03	3 58.1
13	3 19 31.68	1.726	17 35 52.1	7.07	3 54.9
14	3 20 13.36	1.745	17 38 42.2	7.11	3 51.6
15	3 20 55.50	1.764	17 41 33.3	7.15	3 48.4
16	3 21 38.09	+ 1.783	+ 17 44 25.3	+ 7.19	3 45.2
17	3 22 21.13	1.802	17 47 18.1	7.22	3 42.0
18	3 23 4.61	1.820	17 50 11.8	7.25	3 38.8
19	3 23 48.52	1.838	17 53 6.2	7.28	3 35.6
20	3 24 32.85	1.856	17 56 1.3	7.31	3 32.4
21	3 25 17.60	+ 1.873	+ 17 58 57.1	+ 7.34	3 29.2
22	3 26 2.76	1.890	18 1 53.5	7.36	3 26.0
23	3 26 48.32	1.907	18 4 50.5	7.38	3 22.8
24	3 27 34.27	1.923	18 7 48.1	7.40	3 19.6
25	3 28 20.62	1.939	18 10 46.1	7.42	3 16.5
26	3 29 7.35	+ 1.955	+ 18 13 44.6	+ 7.44	3 13.3
27	3 29 54.45	1.970	18 16 43.5	7.46	3 10.1
28	3 30 41.92	1.985	18 19 42.7	7.47	3 7.0
29	3 31 29.75	2.000	18 22 42.2	7.48	3 3.9
30	3 32 17.93	2.015	18 25 42.0	7.49	3 0.7
31	3 33 6.46	+ 2.029	+ 18 28 42.0	+ 7.50	2 57.6
32	3 33 55.33	+ 2.043	+ 18 31 42.2	+ 7.51	2 54.5

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	17.″8	17.″3	16.″9	16.″5
Horizontal Parallax . .	1.7	1.6	1.6	1.6

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	3 33 55.33	+ 2.043	+ 18 31 42.2	+ 7.51	2 54.5
2	3 34 44.54	2.057	18 34 42.5	7.51	2 51.4
3	3 35 34.08	2.071	18 37 42.9	7.52	2 48.3
4	3 36 23.94	2.085	18 40 43.4	7.52	2 45.2
5	3 37 14.12	2.098	18 43 43.9	7.52	2 42.1
6	3 38 4.62	+ 2.111	+ 18 46 44.4	+ 7.52	2 39.0
7	3 38 55.43	2.124	18 49 44.9	7.52	2 35.9
8	3 39 46.54	2.136	18 52 45.3	7.51	2 32.8
9	3 40 37.94	2.148	18 55 45.5	7.51	2 29.7
10	3 41 29.64	2.160	18 58 45.6	7.50	2 26.7
11	3 42 21.63	+ 2.172	+ 19 1 45.5	+ 7.49	2 23.6
12	3 43 13.90	2.184	19 4 45.2	7.48	2 20.6
13	3 44 6.44	2.195	19 7 44.7	7.47	2 17.5
14	3 44 59.25	2.206	19 10 43.9	7.46	2 14.5
15	3 45 52.33	2.217	19 13 42.8	7.45	2 11.4
16	3 46 45.67	+ 2.228	+ 19 16 41.3	+ 7.43	2 8.4
17	3 47 39.27	2.238	19 19 39.3	7.41	2 5.3
18	3 48 33.12	2.248	19 22 37.0	7.39	2 2.3
19	3 49 27.21	2.258	19 25 34.2	7.37	1 59.3
20	3 50 21.53	2.268	19 28 30.9	7.35	1 56.2
21	3 51 16.07	+ 2.277	+ 19 31 27.0	+ 7.33	1 53.2
22	3 52 10.84	2.286	19 34 22.6	7.31	1 50.2
23	3 53 5.83	2.295	19 37 17.6	7.28	1 47.2
24	3 54 1.03	2.304	19 40 11.9	7.25	1 44.1
25	3 54 56.43	2.313	19 43 5.5	7.22	1 41.1
26	3 55 52.03	+ 2.321	+ 19 45 58.5	+ 7.19	1 38.1
27	3 56 47.82	2.329	19 48 50.8	7.16	1 35.1
28	3 57 43.80	2.337	19 51 42.3	7.13	1 32.1
29	3 58 39.96	2.344	19 54 33.0	7.10	1 29.1
30	3 59 36.30	2.351	19 57 22.9	7.07	1 26.1
31	4 0 32.81	+ 2.358	+ 20 0 12.0	+ 7.03	1 23.1
32	4 1 29.48	+ 2.365	+ 20 3 0.2	+ 7.00	1 20.1

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	16.″5	16.″2	16.″0	15.″8
Horizontal Parallax . .	1.6	1.6	1.5	1.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	4 0 32.81	+ 2.358	+20 0 12.0	+ 7.03	1 23.1
2	4 1 29.48	2 365	20 3 0.2	7.00	1 20.1
3	4 2 26.31	2.372	20 5 47.6	6.96	1 17.1
4	4 3 23.30	2.378	20 8 34.1	6 92	1 14.1
5	4 4 20.45	2.384	20 11 19.7	6.88	1 11.1
6	4 5 17.75	+ 2.390	+20 14 4.3	+ 6.84	1 8.2
7	4 6 15.19	2.396	20 16 47.9	6.80	1 5.2
8	4 7 12.78	2.402	20 19 30.5	6.76	1 2.2
9	4 8 10.50	2.408	20 22 12.1	6.72	0 59.2
10	4 9 8.36	2.413	20 24 52.6	6.67	0 56.3
11	4 10 6.34	+ 2.418	+20 27 32.1	+ 6.62	0 53.3
12	4 11 4.44	2.423	20 30 10.5	6.58	0 50.3
13	4 12 2.66	2.428	20 32 47.8	6.54	0 47.4
14	4 13 0.99	2.433	20 35 24.0	6.49	0 44.4
15	4 13 59.42	2.437	20 37 59.0	6.44	0 41.4
16	4 14 57.96	+ 2.441	+20 40 32.9	+ 6.39	0 38.5
17	4 15 56.59	2.445	20 43 5.5	6.34	0 35.5
18	4 16 55.31	2.449	20 45 36.9	6.29	0 32.6
19	4 17 54.11	2.452	20 48 7.2	6.24	0 29.6
20	4 18 52.99	2.455	20 50 36.2	6.19	0 26.7
21	4 19 51.94	+ 2.458	+20 53 3.9	+ 6.13	0 23.7
22	4 20 50.95	2.460	20 55 30.3	6.08	0 20.8
23	4 21 50.01	2.462	20 57 55.5	6.03	0 17.8
24	4 22 49.13	2.464	21 0 19.3	5.97	0 14.9
25	4 23 48.30	2.466	21 2 41.8	5.91	0 11.9
26	4 24 47.51	+ 2.468	+21 5 2.9	+ 5.85	0 9.0
27	4 25 46.76	2.470	21 7 22.7	5.80	0 6.0
28	4 26 46.04	2.471	21 9 41.1	5.74	0 3.1
29	4 27 45.36	2.472	21 11 58.1	5.68	0 0.1 23 57.1
30	4 28 44.70	2.473	21 14 13.7	5.62	23 54.2
31	4 29 44.06	+ 2.474	+21 16 27.9	+ 5.56	23 51.2
32	4 30 43.44	+ 2.474	+21 18 40.7	+ 5.50	23 48.3

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	15″.8	15″.6	15″.5	15″.5
Horizontal Parallax . .	1.5	1.5	1.5	1.5

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	4 30 43.44	+ 2.474	+21 18 40.7	+ 5.50	23 48.3
2	4 31 42.83	2.475	21 20 52.0	5.44	23 45.4
3	4 32 42.23	2.475	21 23 1.9	5 38	23 42.4
4	4 33 41.63	2.475	21 25 10.3	5.32	23 39.5
5	4 34 41.03	2.475	21 27 17.3	5.26	23 36.5
6	4 35 40.42	+ 2.474	+21 29 22.8	+ 5.20	23 33.6
7	4 36 39.80	2.474	21 31 26.8	5.14	23 30.6
8	4 37 39.17	2.473	21 33 29.3	5.08	23 27.7
9	4 38 38.52	2.472	21 35 30.3	5.02	23 24.7
10	4 39 37.84	2.471	21 37 29.8	4.95	23 21.8
11	4 40 37.13	+ 2.470	+21 39 27.8	+ 4.89	23 18.8
12	4 41 36.39	2.468	21 41 24.3	4.82	23 15.9
13	4 42 35.60	2.466	21 43 19.2	4.76	23 12.9
14	4 43 34.76	2.464	21 45 12.6	4.70	23 10.0
15	4 44 33.87	2.462	21 47 4.5	4.63	23 7.0
16	4 45 32.92	+ 2.459	+21 48 54.8	+ 4.57	23 4.1
17	4 46 31.90	2.456	21 50 43.5	4.50	23 1.1
18	4 47 30.81	2.453	21 52 30.7	4.43	22 58.2
19	4 48 29.64	2.450	21 54 16.3	4.37	22 55.2
20	4 49 28.38	2.446	21 56 0.3	4.30	22 52.3
21	4 50 27.04	+ 2.442	+21 57 42.8	+ 4.23	22 49.3
22	4 51 25.60	2.438	21 59 23.7	4.17	22 46.3
23	4 52 24.06	2.434	22 1 3.0	4.10	22 43.4
24	4 53 22.42	2.429	22 2 40.7	4.03	22 40.4
25	4 54 20.66	2.424	22 4 16.9	3.97	22 37.4
26	4 55 18.79	+ 2.419	+22 5 51.5	+ 3.90	22 34.4
27	4 56 16.80	2.414	22 7 24.5	3.84	22 31.5
28	4 57 14.67	2.409	22 8 55.9	3.77	22 28.5
29	4 58 12.41	2.404	22 10 25.8	3.71	22 25.5
30	4 59 10.02	2.398	22 11 54.1	3.65	22 22.5
31	5 0 7.49	+ 2.392	+22 13 20.8	+ 3.58	22 19.5
32	5 1 4.81	+ 2.386	+22 14 46.0	+ 3.52	22 16.6

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	15″.5	15″.5	15″.6	15″.7
Horizontal Parallax . .	1.5	1.5	1.5	1.5

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 0 7.49	+ 2.392	+ 22 13 20.8	+ 3.58	22 19.5	1	5 28 7.51	+ 2.083	+ 22 45 38.3	+ 1.68	20 45.5
2	5 1 4.81	2.386	22 14 46.0	3.52	22 16.6	2	5 28 57.33	2.069	22 46 18.2	1.63	20 42.4
3	5 2 1.98	2.380	22 16 9.6	3.45	22 13.6	3	5 29 46.80	2.055	22 46 56.8	1.58	20 39.3
4	5 2 59.00	2.373	22 17 31.6	3.39	22 10.6	4	5 30 35.93	2.040	22 47 34.1	1.53	20 36.1
5	5 3 55.86	2.366	22 18 52.1	3.32	22 7.6	5	5 31 24.70	2.025	22 48 10.2	1.48	20 33.0
6	5 4 52.56	+ 2.359	+ 22 20 11.0	+ 3.25	22 4.6	6	5 32 13.11	+ 2.010	+ 22 48 45.1	+ 1.43	20 29.9
7	5 5 49.08	2.352	22 21 28.3	3.19	22 1.6	7	5 33 1.15	1.994	22 49 18.9	1.38	20 26.8
8	5 6 45.43	2.344	22 22 44.1	3.12	21 58.6	8	5 33 48.81	1.978	22 49 51.4	1.33	20 23.6
9	5 7 41.60	2.336	22 23 58.3	3.06	21 55.6	9	5 34 36.09	1.962	22 50 22.7	1.28	20 20.5
10	5 8 37.57	2.328	22 25 11.0	3.00	21 52.6	10	5 35 22.98	1.945	22 50 52.9	1.23	20 17.3
11	5 9 33.35	+ 2.320	+ 22 26 22.2	+ 2.93	21 49.6	11	5 36 9.46	+ 1.928	+ 22 51 22.0	+ 1.18	20 14.1
12	5 10 28.92	2.311	22 27 31.9	2.86	21 46.6	12	5 36 55.53	1.911	22 51 49.9	1.14	20 10.9
13	5 11 24.28	2.302	22 28 40.0	2.80	21 43.6	13	5 37 41.18	1.893	22 52 16.7	1.10	20 7.7
14	5 12 19.42	2.293	22 29 46.6	2.74	21 40.5	14	5 38 26.41	1.875	22 52 42.4	1.05	20 4.5
15	5 13 14.34	2.284	22 30 51.7	2.68	21 37.5	15	5 39 11.20	1.857	22 53 7.1	1.00	20 1.3
16	5 14 9.03	+ 2.274	+ 22 31 55.3	+ 2.62	21 34.5	16	5 39 55.55	+ 1.838	+ 22 53 30.8	+ 0.96	19 58.1
17	5 15 3.48	2.264	22 32 57.4	2.56	21 31.5	17	5 40 39.45	1.819	22 53 53.4	0.92	19 54.9
18	5 15 57.68	2.254	22 33 58.1	2.50	21 28.4	18	5 41 22.89	1.800	22 54 15.0	0.88	19 51.7
19	5 16 51.64	2.243	22 34 57.3	2 44	21 25.4	19	5 42 5.86	1.781	22 54 35.7	0.84	19 48.5
20	5 17 45.34	2.232	22 35 55.1	2.38	21 22.4	20	5 42 48.37	1.761	22 54 55.5	0.80	19 45.2
21	5 18 38.78	+ 2.221	+ 22 36 51.4	+ 2.32	21 19.4	21	5 43 30.40	+ 1.741	+ 22 55 14.3	+ 0.76	19 42.0
22	5 19 31.95	2.210	22 37 46.2	2.26	21 16.3	22	5 44 11.94	1.721	22 55 32.2	0.72	19 38.7
23	5 20 24.85	2.198	22 38 39.6	2.20	21 13.3	23	5 44 52.99	1.700	22 55 49.2	0.69	19 35.5
24	5 21 17.46	2.186	22 39 31.6	2.14	21 10.2	24	5 45 33.54	1.679	22 56 5.4	0.66	19 32.2
25	5 22 9.78	2.174	22 40 22.2	2.08	21 7.2	25	5 46 13.59	1.658	22 56 20.7	0.62	19 29.0
26	5 23 1.81	+ 2.162	+ 22 41 11.5	+ 2.02	21 4.1	26	5 46 53.12	+ 1.636	+ 22 56 35.2	+ 0.58	19 25.7
27	5 23 53.54	2.149	22 41 59.3	1.96	21 1.0	27	5 47 32.13	1.614	22 56 48.9	0.55	19 22.4
28	5 24 44.97	2.136	22 42 45.8	1.90	20 57.9	28	5 48 10.62	1.592	22 57 1.8	0.52	19 19.1
29	5 25 36.09	2.123	22 43 30.9	1.85	20 54.8	29	5 48 48.57	1.570	22 57 13.9	0.49	19 15.8
30	5 26 26.88	2.110	22 44 14.6	1.80	20 51.7	30	5 49 25.98	1.547	22 57 25.3	0.46	19 12.5
31	5 27 17.36	+ 2.097	+ 22 44 57.1	+ 1.74	20 48.6	31	5 50 2.84	+ 1.524	+ 22 57 36.0	+ 0.43	19 9.2
32	5 28 7.51	+ 2.083	+ 22 45 38.3	+ 1.68	20 45.5	32	5 50 39.15	+ 1.500	+ 22 57 46.0	+ 0.40	19 5.8

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	15″.7	15″.9	16″.1	16″.4	Polar Semidiameter . .	16″.5	16″.8	17″.2	17″.7
Horizontal Parallax . .	1.5	1.5	1.5	1.5	Horizontal Parallax . .	1.5	1.6	1.6	1.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 50 39.15	+ 1.500	+22 57 46.0	+ 0.40	19 5.8
2	5 51 14.89	1.477	22 57 55.4	0.37	19 2.5
3	5 51 50.05	1.453	22 58 4.1	0.35	18 59.2
4	5 52 24.63	1.428	22 58 12.1	0.32	18 55.8
5	5 52 58.62	1.403	22 58 19.6	0.30	18 52.4
6	5 53 32.01	+ 1.378	+22 58 26.5	+ 0.28	18 49.0
7	5 54 4.79	1.353	22 58 32.9	0.26	18 45.6
8	5 54 36.95	1.327	22 58 38.8	0.24	18 42.2
9	5 55 8.48	1.301	22 58 44.2	0.22	18 38.8
10	5 55 39.38	1.274	22 58 49.1	0.20	18 35.4
11	5 56 9.64	+ 1.247	+22 58 53.6	+ 0.18	18 32.0
12	5 56 39.24	1.220	22 58 57.7	0.16	18 28.5
13	5 57 8.18	1.192	22 59 1.4	0.15	18 25.0
14	5 57 36.45	1.164	22 59 4.7	0.13	18 21.5
15	5 58 4.04	1.136	22 59 7.7	0.11	18 18.0
16	5 58 30.95	+ 1.107	+22 59 10.3	+ 0.10	18 14.5
17	5 58 57.17	1.078	22 59 12.7	0.09	18 11.0
18	5 59 22.69	1.049	22 59 14.8	0.08	18 7.5
19	5 59 47.50	1.019	22 59 16.7	0.07	18 4.0
20	6 0 11.59	0.989	22 59 18.3	0.06	18 0.5
21	6 0 34.96	+ 0.959	+22 59 19.7	+ 0.05	17 56.9
22	6 0 57.61	0.928	22 59 20.9	0.04	17 53.4
23	6 1 19.52	0.897	22 59 21.9	0.04	17 49.8
24	6 1 40.69	0.866	22 59 22.8	0.03	17 46.2
25	6 2 1.12	0.835	22 59 23.5	0.03	17 42.6
26	6 2 20.80	+ 0.804	+22 59 24.1	+ 0.02	17 39.0
27	6 2 39.72	0.772	22 59 24.6	0.02	17 35.4
28	6 2 57.88	0.740	22 59 25.0	0.01	17 31.7
29	6 3 15.26	0.708	22 59 25.3	0.01	17 28.0
30	6 3 31.88	0.675	22 59 25.5	0.01	17 24.4
31	6 3 47.69	+ 0.642	+22 59 25.8	+ 0.01	17 20.7
32	6 4 2.70	+ 0.609	+22 59 26.1	+ 0.01	17 17.0

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	17″.7	18″.2	18″.7	19″.3
Horizontal Parallax . .	1.7	1.7	1.8	1.8

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 3 47.69	+ 0.642	+22 59 25.8	+ 0.01	17 20.7
2	6 4 2.70	0.609	22 59 26.1	0.01	17 17.0
3	6 4 16.91	0.575	22 59 26.5	0.02	17 13.3
4	6 4 30.32	0.541	22 59 26.9	0.02	17 9.6
5	6 4 42.91	0.507	22 59 27.3	0.02	17 5.9
6	6 4 54.68	+ 0.473	+22 59 27.8	+ 0.02	17 2.1
7	6 5 5.62	0.439	22 59 28.4	0.03	16 58.3
8	6 5 15.73	0.404	22 59 29.1	0.03	16 54.5
9	6 5 25.00	0.369	22 59 29.9	0.04	16 50.7
10	6 5 33.42	0.334	22 59 30.9	0.04	16 46.9
11	6 5 40.99	+ 0.298	+22 59 32.0	+ 0.05	16 43.1
12	6 5 47.70	0.262	22 59 33.2	0.05	16 39.3
13	6 5 53.55	0.226	22 59 34.5	0.06	16 35.5
14	6 5 58.54	0.190	22 59 36.0	0.07	16 31.6
15	6 6 2.67	0.154	22 59 37.7	0.07	16 27.7
16	6 6 5.93	+ 0.118	+22 59 39.5	+ 0.08	16 23.8
17	6 6 8.32	0.082	22 59 41.5	0.08	16 19.9
18	6 6 9.84	0.045	22 59 43.7	0.09	16 16.0
19	6 6 10.49	+ 0.009	22 59 46.0	0.10	16 12.1
20	6 6 10.27	− 0.028	22 59 48.5	0.11	16 8.2
21	6 6 9 17	− 0.064	+22 59 51.2	+ 0.12	16 4.2
22	6 6 7.19	0.100	22 59 54.1	0.13	16 0.2
23	6 6 4.35	0.136	22 59 57.3	0.14	15 56.2
24	6 6 0.64	0.172	23 0 0.7	0.15	15 52.2
25	6 5 56.06	0.208	23 0 4.2	0.15	15 48.2
26	6 5 50.60	− 0.244	+23 0 7.8	+ 0 16	15 44.2
27	6 5 44.28	0.280	23 0 11.6	0.16	15 40.1
28	6 5 37.09	0.317	23 0 15.6	0.17	15 36.1
29	6 5 29.04	0.353	23 0 19.8	0.17	15 32.0
30	6 5 20.13	0.389	23 0 24.1	0.18	15 27.9
31	6 5 10.35	− 0.425	+23 0 28.6	+ 0.19	15 23.8
32	6 4 59.71	− 0.461	+23 0 33.3	+ 0.20	15 19.7

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	19″.3	19″.9	20″.6	21″.2
Horizontal Parallax . .	1.8	1.9	1.9	2.0

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 4 59.71	− 0.461	+23 0 33.3	+ 0.20	15 19.7	1	5 53 44.25	− 1.326	+23 2 50.9	+ 0.08	13 10.4
2	6 4 48.21	0.497	23 0 38.1	0.20	15 15.6	2	5 53 12.23	1.343	23 2 52.6	0.06	13 5.9
3	6 4 35.86	0.533	23 0 43.0	0.21	15 11.5	3	5 52 39.80	1.359	23 2 54.0	0.05	13 1.4
4	6 4 22.66	0.568	23 0 48.0	0.21	15 7.3	4	5 52 6.98	1.374	23 2 55.0	0.03	12 56.9
5	6 4 8.62	0.603	23 0 53.1	0.21	15 3.1	5	5 51 33.78	1.389	23 2 55.6	+ 0.02	12 52.4
6	6 3 53.75	− 0.638	+23 0 58.4	+ 0.22	14 58.9	6	5 51 0.25	− 1.403	+23 2 55.8	0.00	12 47.9
7	6 3 38.04	0.672	23 1 3.7	0.22	14 54.7	7	5 50 26.40	1.416	23 2 55.6	− 0.02	12 43.4
8	6 3 21.51	0.706	23 1 9.1	0.22	14 50.5	8	5 49 52.27	1.428	23 2 55.0	0.03	12 38.9
9	6 3 4.17	0.740	23 1 14.5	0.23	14 46.3	9	5 49 17.86	1.439	23 2 54.0	0.05	12 34.4
10	6 2 46.03	0.773	23 1 20.0	0.23	14 42.1	10	5 48 43.23	1.448	23 2 52.6	0.07	12 29.9
11	6 2 27.09	− 0.806	+23 1 25.5	+ 0.23	14 37.8	11	5 48 8.39	− 1.456	+23 2 50.8	− 0.09	12 25.4
12	6 2 7.37	0.838	23 1 31.1	0.23	14 33.5	12	5 47 33.37	1.463	23 2 48.5	0.11	12 20.9
13	6 1 46.88	0.870	23 1 36.7	0.23	14 29.2	13	5 46 58.19	1.469	23 2 45.7	0.13	12 16.4
14	6 1 25.64	0.901	23 1 42.2	0.23	14 24.9	14	5 46 22.89	1.473	23 2 42.4	0.14	12 11.9
15	6 1 3.66	0.931	23 1 47.6	0.22	14 20.6	15	5 45 47.50	1.476	23 2 38.7	0.16	12 7.4
16	6 0 40.95	− 0.961	+23 1 52.8	+ 0.22	14 16.3	16	5 45 12.05	− 1.478	+23 2 34.7	− 0.18	12 2.9
17	6 0 17.53	0.990	23 1 58.0	0.21	14 12.0	17	5 44 36.56	1.479	23 2 30.3	0.19	11 58.4
18	5 59 53.41	1.019	23 2 3.1	0.21	14 7.7	18	5 44 1.06	1.478	23 2 25.5	0.20	11 53.8
19	5 59 28.60	1.047	23 2 8.1	0.20	14 3.3	19	5 43 25.58	1.476	23 2 20.3	0.22	11 49.3
20	5 59 3.14	1.074	23 2 12.9	0.20	13 58.9	20	5 42 50.14	1.474	23 2 14.7	0.24	11 44.7
21	5 58 37.03	− 1.101	+23 2 17.5	+ 0.19	13 54.6	21	5 42 14.78	− 1.471	+23 2 8.8	− 0.26	11 40.2
22	5 58 10.29	1.127	23 2 21.9	0.18	13 50.2	22	5 41 39.51	1.467	23 2 2.5	0.27	11 35.7
23	5 57 42.93	1.152	23 2 26.1	0.17	13 45.8	23	5 41 4.37	1.461	23 1 55.8	0.29	11 31.2
24	5 57 14.98	1.176	23 2 30.2	0.16	13 41.4	24	5 40 29.38	1.454	23 1 48.8	0.30	11 26.7
25	5 56 46.46	1.200	23 2 34.0	0.15	13 37.0	25	5 39 54.58	1.446	23 1 41.5	0.32	11 22.2
26	5 56 17.38	− 1.223	+23 2 37.5	+ 0.14	13 32.6	26	5 39 19.97	− 1.437	+23 1 33.9	− 0.33	11 17.7
27	5 55 47.75	1.246	23 2 40.8	0.13	13 28.2	27	5 38 45.59	1.427	23 1 26.0	0.34	11 13.2
28	5 55 17.61	1.268	23 2 43.8	0.12	13 23.7	28	5 38 11.46	1.416	23 1 17.8	0.35	11 8.7
29	5 54 46.97	1.289	23 2 46.5	0.11	13 19.3	29	5 37 37.60	1.404	23 1 9.3	0.36	11 4.2
30	5 54 15.85	1.308	23 2 48.9	0.10	13 14.9	30	5 37 4.05	1.391	23 1 0.5	0 37	10 59.7
31	5 53 44.25	− 1.326	+23 2 50.9	+ 0.08	13 10.4	31	5 36 30.82	− 1.377	+23 0 51.7	− 0.38	10 55.2
32	5 53 12.23	− 1.343	+23 2 52.6	+ 0.06	13 5.9	32	5 35 57.95	− 1.362	+23 0 42.8	− 0.38	10 50.8

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	21″.2	21″.8	22″.2	22″.5	Polar Semidiameter . .	22″.5	22″.7	22″.7	22″.6
Horizontal Parallax . .	2.0	2.0	2.1	2.1	Horizontal Parallax . .	2.1	2.1	2.1	2.1

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	2 16 27.83	− 0.113	+ 11 3 3.1	+ 0.19	7 31.1
2	2 16 25.33	0.095	11 3 8.8	0.29	7 27.1
3	2 16 23.25	0.078	11 3 16.7	0.38	7 23.1
4	2 16 21.60	0.060	11 3 26.9	0.47	7 19.2
5	2 16 20.38	0.042	11 3 39.3	0.56	7 15.2
6	2 16 19.59	− 0.024	+ 11 3 54.0	+ 0.66	7 11.3
7	2 16 19.23	− 0.006	11 4 10.9	0.75	7 7.3
8	2 16 19.30	+ 0.012	11 4 30.1	0.85	7 3.4
9	2 16 19.79	0.029	11 4 51.5	0.94	6 59.5
10	2 16 20.71	0.047	11 5 15.2	1.04	6 55.6
11	2 16 22.06	+ 0.065	+ 11 5 41.1	+ 1.13	6 51.7
12	2 16 23.84	0.083	11 6 9.3	1.22	6 47.8
13	2 16 26.05	0.101	11 6 39.7	1.31	6 43.9
14	2 16 28.70	0.119	11 7 12.3	1.41	6 40.0
15	2 16 31.78	0.137	11 7 47.2	1.50	6 36.1
16	2 16 35.29	+ 0.155	+ 11 8 24.2	+ 1.59	6 32.3
17	2 16 39.23	0.173	11 9 3.4	1.68	6 28.4
18	2 16 43.60	0.191	11 9 44.7	1.77	6 24.5
19	2 16 48.40	0.209	11 10 28.2	1.86	6 20.7
20	2 16 53.62	0.227	11 11 13.9	1.95	6 16.8
21	2 16 59.28	+ 0.245	+ 11 12 1.7	+ 2.04	6 13.0
22	2 17 5.36	0.263	11 12 51.7	2.13	6 9.2
23	2 17 11.86	0.280	11 13 43.8	2.21	6 5.3
24	2 17 18.78	0.298	11 14 37.9	2.30	6 1.5
25	2 17 26.12	0.315	11 15 34.1	2.39	5 57.7
26	2 17 33.88	+ 0.333	+ 11 16 32.4	+ 2.47	5 53.9
27	2 17 42.05	0.350	11 17 32.6	2.55	5 50.1
28	2 17 50.62	0.367	11 18 34.9	2.64	5 46.3
29	2 17 59.60	0.383	11 19 39.2	2.72	5 42.6
30	2 18 8.99	0.400	11 20 45.4	2.80	5 38.8
31	2 18 18.78	+ 0.417	+ 11 21 53.5	+ 2.88	5 35.0
32	2 18 28.97	+ 0.433	+ 11 23 3.6	+ 2.96	5 31.2

D.y of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8″.9	8″.8	8″.6	8″.5
Horizontal Parallax . .	1.0	1.0	1.0	1.0

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	2 18 28.97	+ 0.433	+ 11 23 3.6	+ 2.96	5 31.2
2	2 18 39.55	0.449	11 24 15.6	3.04	5 27.5
3	2 18 50.53	0.466	11 25 29.4	3.12	5 23.7
4	2 19 1.90	0.482	11 26 45.1	3.19	5 20.0
5	2 19 13.66	0.498	11 28 2.6	3.27	5 16.3
6	2 19 25.80	+ 0.514	+ 11 29 21.9	+ 3.34	5 12.5
7	2 19 38.32	0.530	11 30 43.0	3.42	5 8.8
8	2 19 51.22	0.545	11 32 5.8	3.49	5 5.1
9	2 20 4.50	0.561	11 33 30.4	3.56	5 1.4
10	2 20 18.15	0.576	11 34 56.7	3.63	4 57.7
11	2 20 32.17	+ 0.592	+ 11 36 24.7	+ 3.70	4 54.0
12	2 20 46.56	0.607	11 37 54.4	3.77	4 50.3
13	2 21 1.31	0.622	11 39 25.7	3.84	4 46.6
14	2 21 16.42	0.637	11 40 58.7	3.91	4 42.9
15	2 21 31.89	0.652	11 42 33.2	3.98	4 39.3
16	2 21 47.71	+ 0.667	+ 11 44 9.3	+ 4.04	4 35.6
17	2 22 3.89	0.682	11 45 47.0	4.10	4 31.9
18	2 22 20.41	0.696	11 47 26.2	4.16	4 28.3
19	2 22 37.28	0.710	11 49 6.8	4.23	4 24.6
20	2 22 54.48	0.724	11 50 48.9	4.29	4 21.0
21	2 23 12.02	+ 0.738	+ 11 52 32.5	+ 4.35	4 17.3
22	2 23 29.89	0.752	11 54 17.5	4.40	4 13.7
23	2 23 48.09	0.765	11 56 3.8	4.46	4 10.1
24	2 24 6.61	0.778	11 57 51.5	4.51	4 6.4
25	2 24 25.44	0.791	11 59 40.5	4.57	4 2.8
26	2 24 44.59	+ 0.804	+ 12 1 30.8	+ 4.62	3 59.2
27	2 25 4.05	0.817	12 3 22.4	4.67	3 55.6
28	2 25 23.81	0.830	12 5 15.2	4.72	3 52.0
29	2 25 43.87	0.842	12 7 9.1	4.77	3 48.4
30	2 26 4.23	0.854	12 9 4.2	4.82	3 44.8
31	2 26 24.87	+ 0.866	+ 12 11 0.4	+ 4.87	3 41.2
32	2 26 45.80	+ 0.878	+ 12 12 57.7	+ 4.91	3 37.6

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8″.4	8″.3	8″.2	8″.0
Horizontal Parallax . .	1.0	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	2 25 43.87	+ 0.842	+ 12 7 9.1	+ 4.77	3 48.4	1	2 38 12.01	+ 1.140	+ 13 13 27.0	+ 5.74	1 58.9
2	2 26 4.23	0.854	12 9 4.2	4.82	3 44.8	2	2 38 39.46	1.147	13 15 44.9	5.75	1 55.5
3	2 26 24.87	0.866	12 11 0.4	4.87	3 41.2	3	2 39 7.07	1.154	13 18 3.0	5.76	1 52.0
4	2 26 45.80	0.878	12 12 57.7	4.91	3 37.6	4	2 39 34.83	1.160	13 20 21.4	5.77	1 48.5
5	2 27 7.01	0.890	12 14 56.1	4.96	3 34.1	5	2 40 2.74	1.166	13 22 40.1	5.78	1 45.0
6	2 27 28.50	+ 0.901	+ 12 16 55.6	+ 5.00	3 30.5	6	2 40 30.79	+ 1.172	+ 13 24 59.0	+ 5.79	1 41.6
7	2 27 50.27	0.913	12 18 56.1	5.05	3 26.9	7	2 40 58.99	1 178	13 27 18.2	5.80	1 38.1
8	2 28 12.31	0.924	12 20 57.7	5.09	3 23.3	8	2 41 27.32	1.184	13 29 37.5	5.81	1 34.7
9	2 28 34.62	0.935	12 23 0.2	5.13	3 19.8	9	2 41 55.79	1.189	13 31 57.0	5.81	1 31.2
10	2 28 57.19	0.946	12 25 3.7	5.17	3 16.2	10	2 42 24.39	1.195	13 34 16.6	5.82	1 27.7
11	2 29 20.02	+ 0.957	+ 12 27 8.2	+ 5.21	3 12.7	11	2 42 53.12	+ 1.200	+ 13 36 36.4	+ 5.82	1 24.3
12	2 29 43.10	0.967	12 29 13.6	5.24	3 9.1	12	2 43 21.97	1.205	13 38 56.2	5.83	1 20.8
13	2 30 6.44	0.978	12 31 19.9	5.28	3 5.6	13	2 43 50.94	1.210	13 41 16.1	5.83	1 17.4
14	2 30 30.03	0.988	12 33 27.0	5.31	3 2.0	14	2 44 20.03	1.215	13 43 36.1	5.83	1 13.9
15	2 30 53.87	0.998	12 35 34.8	5.35	2 58.5	15	2 44 49.22	1.219	13 45 56.1	5.83	1 10.5
16	2 31 17.95	+ 1.008	+ 12 37 43.5	+ 5.38	2 55.0	16	2 45 18.52	+ 1.223	+ 13 48 16.0	+ 5.83	1 7.0
17	2 31 42.26	1.018	12 39 52.9	5.41	2 51.4	17	2 45 47.92	1.227	13 50 35.9	5.83	1 3.6
18	2 32 6.80	1.027	12 42 3.0	5.44	2 47.9	18	2 46 17.42	1.231	13 52 55.7	5.83	1 0.2
19	2 32 31.57	1.037	12 44 13.9	5.47	2 44.4	19	2 46 47.01	1.235	13 55 15.5	5.82	0 56.7
20	2 32 56.56	1.046	12 46 25.5	5.50	2 40.9	20	2 47 16.69	1.238	13 57 35.2	5.82	0 53.3
21	2 33 21.77	+ 1.055	+ 12 48 37.7	+ 5.53	2 37.4	21	2 47 46.45	+ 1.241	+ 13 59 54.8	+ 5.81	0 49.8
22	2 33 47.19	1.064	12 50 50.6	5.55	2 33.9	22	2 48 16.28	1.244	14 2 14.2	5.81	0 46.4
23	2 34 12.82	1.072	12 53 4.0	5.57	2 30.3	23	2 48 46.19	1.247	14 4 33.4	5.80	0 43.0
24	2 34 38.65	1.080	12 55 18.0	5.59	2 26.8	24	2 49 16.16	1.250	14 6 52.5	5.79	0 39.5
25	2 35 4.67	1.088	12 57 32.5	5.62	2 23.3	25	2 49 46.20	1.253	14 9 11.4	5.78	0 36.1
26	2 35 30.89	+ 1.096	+ 12 59 47.6	+ 5.64	2 19.8	26	2 50 16.30	+ 1.255	+ 14 11 30.0	+ 5.77	0 32.6
27	2 35 57.30	1.104	13 2 3.1	5.66	2 16.4	27	2 50 46.45	1.257	14 13 48.3	5.76	0 29.2
28	2 36 23.89	1.112	13 4 19.1	5.67	2 12.9	28	2 51 16.65	1.259	14 16 6.4	5.75	0 25.8
29	2 36 50.66	1.119	13 6 35.5	5.69	2 9.4	29	2 51 46.90	1.261	14 18 24.1	5.73	0 22.4
30	2 37 17.60	1.126	13 8 52.3	5.71	2 5.9	30	2 52 17.19	1.262	14 20 41.5	5.72	0 18.9
31	2 37 44.73	+ 1.133	+ 13 11 9.5	+ 5.73	2 2.4	31	2 52 47.52	+ 1.264	+ 14 22 58.6	+ 5.70	0 15.5
32	2 38 12.01	+ 1.140	+ 13 13 27.0	+ 5.74	1 58.9	32	2 53 17.88	+ 1.266	+ 14 25 15.3	+ 5.69	0 12.1

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8″.1	8″.0	7″.9	7″.8	Polar Semidiameter . .	7″.8	7″.7	7″.7	7″.7
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	2 52 47.52	+ 1.264	+ 14 22 58.6	+ 5.70	0 15.5	1	3 8 24.43	+ 1.225	+ 15 29 23.1	+ 4.89	22 25.7
2	2 53 17.88	1.266	14 25 15.3	5.69	0 12.1	2	3 8 53.79	1.221	15 31 20.0	4.85	22 22.3
3	2 53 48.27	1.267	14 27 31.6	5.67	0 8.6	3	3 9 23.04	1.217	15 33 16.0	4.82	22 18.8
4	2 54 18.69	1.268	14 29 47.6	5.66	0 5.2	4	3 9 52.19	1.212	15 35 11.1	4.78	22 15.4
5	2 54 49.13	1.269	14 32 3.2	5.64	{ 0 1.8 } 23 58.4	5	3 10 21.24	1.208	15 37 5.4	4.74	22 11.9
6	2 55 19.59	+ 1.269	+ 14 34 18.4	+ 5.62	23 54.9	6	3 10 50.18	+ 1.203	+ 15 38 58.7	+ 4.70	22 8.5
7	2 55 50.07	1.270	14 36 33.1	5.60	23 51.5	7	3 11 19.00	1.198	15 40 51.1	4.66	22 5.0
8	2 56 20.56	1.270	14 38 47.4	5.58	23 48.1	8	3 11 47.70	1.193	15 42 42.5	4.62	22 1.5
9	2 56 51.06	1.271	14 41 1.2	5.56	23 44.7	9	3 12 16.28	1.188	15 44 33.0	4.58	21 58.1
10	2 57 21.56	1.271	14 43 14.4	5.54	23 41.2	10	3 12 44.72	1.182	15 46 22.4	4.54	21 54.6
11	2 57 52.06	+ 1.271	+ 14 45 27.2	+ 5.52	23 37.8	11	3 13 13.03	+ 1.177	+ 15 48 10.9	+ 4.50	21 51.2
12	2 58 22.56	1.271	14 47 39.4	5.50	23 34.4	12	3 13 41.20	1.171	15 49 58.4	4.45	21 47.7
13	2 58 53.05	1.270	14 49 51.0	5.47	23 30.9	13	3 14 9.23	1.165	15 51 44.8	4.41	21 44.2
14	2 59 23.52	1.269	14 52 2.1	5.45	23 27.5	14	3 14 37.11	1.159	15 53 30.2	4.36	21 40.7
15	2 59 53.98	1.269	14 54 12.6	5.42	23 24.1	15	3 15 4.84	1.153	15 55 14.5	4.32	21 37.3
16	3 0 24.41	+ 1.268	+ 14 56 22.5	+ 5.40	23 20.7	16	3 15 32.41	+ 1.146	+ 15 56 57.8	+ 4.28	21 33.8
17	3 0 54.82	1.266	14 58 31.8	5.37	23 17.2	17	3 15 59.83	1.139	15 58 40.0	4.24	21 30.3
18	3 1 25.19	1.265	15 0 40.4	5.35	23 13.8	18	3 16 27.08	1.132	16 0 21.1	4.19	21 26.8
19	3 1 55.53	1.263	15 2 48.3	5.32	23 10.4	19	3 16 54.16	1.125	16 2 1.0	4.15	21 23.4
20	3 2 25.82	1.261	15 4 55.6	5.29	23 7.0	20	3 17 21.06	1.117	16 3 39.9	4.10	21 19.9
21	3 2 56.06	+ 1.259	+ 15 7 2.1	+ 5.26	23 3.5	21	3 17 47.78	+ 1.110	+ 16 5 17.6	+ 4.05	21 16.4
22	3 3 26.25	1.257	15 9 7.9	5.23	23 0.1	22	3 18 14.31	1.102	16 6 54.3	4.00	21 12.9
23	3 3 56.38	1.254	15 11 13.0	5.20	22 56.7	23	3 18 40.65	1.094	16 8 29.8	3.96	21 9.4
24	3 4 26.45	1.252	15 13 17.3	5.17	22 53.2	24	3 19 6.80	1.085	16 10 4.2	3.91	21 5.9
25	3 4 56.46	1.249	15 15 20.9	5.13	22 49.8	25	3 19 32.75	1.077	16 11 37.5	3.86	21 2.4
26	3 5 26.40	+ 1.246	+ 15 17 23.7	+ 5.10	22 46.4	26	3 19 58.50	+ 1.069	+ 16 13 9.6	+ 3.81	20 58.9
27	3 5 56.27	1.243	15 19 25.7	5.07	22 42.9	27	3 20 24.05	1.060	16 14 40.4	3.76	20 55.3
28	3 6 26.06	1.240	15 21 26.9	5.04	22 39.5	28	3 20 49.39	1.051	16 16 10.1	3.71	20 51.8
29	3 6 55.78	1.237	15 23 27.2	5.00	22 36.0	29	3 21 14.51	1.042	16 17 38.6	3.66	20 48.3
30	3 7 25.42	1.233	15 25 26.7	4.96	22 32.6	30	3 21 39.42	1.033	16 19 5.9	3 61	20 44.8
31	3 7 54.97	+ 1.229	+ 15 27 25.3	+ 4.93	22 29.2	31	3 22 4.11	+ 1.024	+ 16 20 32.0	+ 3.56	20 41.3
32	3 8 24.43	+ 1.225	+ 15 29 23.1	+ 4.89	22 25.7	32	3 22 28.57	+ 1.015	+ 16 21 56.9	+ 3.51	20 37.7

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
	″	″	″	″		″	″	″	″
Polar Semidiameter . .	7.7	7.7	7.7	7.7	Polar Semidiameter . .	7.7	7.8	7.9	8.0
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	3 22 4.11	+ 1.024	+ 16 20 32.0	+ 3.56	20 41.3	1	3 32 36.24	+ 0.647	+ 16 54 13.5	+ 1.83	18 49.7
2	3 22 28.57	1.015	16 21 56.9	3.51	20 37.7	2	3 32 51.59	0.632	16 54 56.7	1.77	18 46.1
3	3 22 52.81	1.005	16 23 20.5	3.46	20 34.2	3	3 33 6.59	0.617	16 55 38.4	1.71	18 42.4
4	3 23 16.81	0.995	16 24 42.9	3.41	20 30.7	4	3 33 21.23	0.602	16 56 18.7	1.65	18 38.7
5	3 23 40.58	0.985	16 26 4.0	3.36	20 27.1	5	3 33 35.50	0.587	16 56 57.5	1.59	18 35.0
6	3 24 4.11	+ 0.975	+ 16 27 23.9	+ 3.30	20 23.6	6	3 33 49.41	+ 0.572	+ 16 57 34.8	+ 1.53	18 31.3
7	3 24 27.39	0.965	16 28 42.5	3.25	20 20.0	7	3 34 2.94	0.556	16 58 10.7	1.46	18 27.6
8	3 24 50.42	0.954	16 29 59.8	3.20	20 16.5	8	3 34 16.10	0.541	16 58 45.1	1.40	18 23.8
9	3 25 13.20	0.943	16 31 15.9	3.15	20 12.9	9	3 34 28.88	0.525	16 59 18.1	1.34	18 20.1
10	3 25 35.71	0.932	16 32 30.7	3.09	20 9.4	10	3 34 41.28	0.509	16 59 49.6	1.28	18 16.4
11	3 25 57.96	+ 0.921	+ 16 33 44.2	+ 3.04	20 5.8	11	3 34 53.29	+ 0.492	+ 17 0 19.6	+ 1.22	18 12.6
12	3 26 19.94	0.910	16 34 56.4	2.98	20 2.2	12	3 35 4.90	0.476	17 0 48.2	1.16	18 8.9
13	3 26 41.64	0.899	16 36 7.3	2.93	19 58.7	13	3 35 16.11	0.459	17 1 15.2	1.10	18 5.1
14	3 27 3.07	0.887	16 37 16.8	2.87	19 55.1	14	3 35 26.93	0.443	17 1 40.8	1.04	18 1.4
15	3 27 24.21	0.875	16 38 25.0	2.82	19 51.5	15	3 35 37.35	0.426	17 2 4.9	0.97	17 57.6
16	3 27 45.07	+ 0.863	+ 16 39 31.8	+ 2.76	19 47.9	16	3 35 47.36	+ 0.409	+ 17 2 27.5	+ 0.91	17 53.8
17	3 28 5.63	0.851	16 40 37.3	2.70	19 44.3	17	3 35 56.96	0.392	17 2 48.6	0.85	17 50.1
18	3 28 25.90	0.838	16 41 41.4	2.64	19 40.7	18	3 36 6.16	0.375	17 3 8.2	0.79	17 46.3
19	3 28 45.86	0.826	16 42 44.2	2.59	19 37.1	19	3 36 14.95	0.357	17 3 26.3	0.72	17 42.5
20	3 29 5.52	0.813	16 43 45.6	2.53	19 33.5	20	3 36 23.32	0.340	17 3 42.9	0.66	17 38.7
21	3 29 24.87	+ 0.800	+ 16 44 45.6	+ 2.47	19 29.9	21	3 36 31.27	+ 0.323	+ 17 3 58.0	+ 0.60	17 34.9
22	3 29 43.90	0.786	16 45 44.2	2.41	19 26.2	22	3 36 38.81	0.306	17 4 11.7	0.54	17 31.1
23	3 30 2.62	0.773	16 46 41.4	2.36	19 22.6	23	3 36 45.93	0.288	17 4 23.8	0.47	17 27.3
24	3 30 21.02	0.760	16 47 37.2	2.30	19 19.0	24	3 36 52.63	0.271	17 4 34.5	0.41	17 23.4
25	3 30 39.09	0.746	16 48 31.7	2.24	19 15.3	25	3 36 58.91	0.253	17 4 43.7	0.35	17 19.6
26	3 30 56.83	+ 0.732	+ 16 49 24.8	+ 2.18	19 11.7	26	3 37 4.76	+ 0.235	+ 17 4 51.4	+ 0.29	17 15.8
27	3 31 14.25	0.719	16 50 16.5	2.12	19 8.1	27	3 37 10.18	0.217	17 4 57.6	0.23	17 11.9
28	3 31 31.33	0.705	16 51 6.7	2.06	19 4.4	28	3 37 15.18	0.199	17 5 2.4	0.17	17 8.1
29	3 31 48.07	0.691	16 51 55.5	2.01	19 0.7	29	3 37 19.75	0.181	17 5 5.6	0.10	17 4.2
30	3 32 4.47	0.676	16 52 42.9	1.95	18 57.1	30	3 37 23.88	0.163	17 5 7.4	+ 0.04	17 0.3
31	3 32 20.53	+ 0.662	+ 16 53 28.9	+ 1.89	18 53.4	31	3 37 27.58	+ 0.145	+ 17 5 7.6	− 0.02	16 56.5
32	3 32 36.24	+ 0.647	+ 16 54 13.5	+ 1.83	18 49.7	32	3 37 30.85	+ 0.127	+ 17 5 6.4	− 0.08	16 52.6

Day of the Month.	1st.	11th.	21st.	31st.	Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8.″0	8.″1	8.″2	8.″3	Polar Semidiameter . .	8.″4	8.″5	8.″6	8.″8
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	1.0	1.0	1.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 37 30.85	+ 0.127	+ 17 5 6.4	− 0.08	16 52.6
2	3 37 33.68	0.109	17 5 3.7	0.14	16 48.7
3	3 37 36.08	0.091	17 4 59.5	0.20	16 44.8
4	3 37 38.04	0.073	17 4 53.9	0.26	16 40.9
5	3 37 39.57	0.055	17 4 46.8	0.33	16 37.0
6	3 37 40.65	+ 0.036	+ 17 4 38.2	− 0.39	16 33.1
7	3 37 41.29	+ 0.018	17 4 28.2	0.45	16 29.1
8	3 37 41.49	− 0.001	17 4 16.7	0.51	16 25.2
9	3 37 41.25	0.020	17 4 3.7	0.57	16 21.3
10	3 37 40.56	0.038	17 3 49.3	0.63	16 17.3
11	3 37 39.43	− 0.057	+ 17 3 33.4	− 0.69	16 13.4
12	3 37 37.86	0.075	17 3 16.1	0.75	16 9.4
13	3 37 35.85	0.093	17 2 57.4	0.81	16 5.4
14	3 37 33.39	0.111	17 2 37.3	0.87	16 1.4
15	3 37 30.50	0.130	17 2 15.7	0.93	15 57.4
16	3 37 27.17	− 0.148	+ 17 1 52.8	− 0.99	15 53.5
17	3 37 23.40	0.166	17 1 28.4	1.05	15 49.5
18	3 37 19.20	0.184	17 1 2.6	1.11	15 45.5
19	3 37 14.56	0.202	17 0 35.3	1.17	15 41.5
20	3 37 9.50	0.220	17 0 6.7	1.22	15 37.4
21	3 37 4.01	− 0.238	+ 16 59 36.7	− 1.28	15 33.4
22	3 36 58.10	0.255	16 59 5.5	1.33	15 29.4
23	3 36 51.77	0.273	16 58 32.9	1.39	15 25.3
24	3 36 45.02	0.290	16 57 59.0	1.44	15 21.3
25	3 36 37.86	0.307	16 57 23.8	1.50	15 17.2
26	3 36 30.28	− 0.324	+ 16 56 47.3	− 1.55	15 13.2
27	3 36 22.30	0.341	16 56 9.5	1.60	15 9.1
28	3 36 13.91	0.358	16 55 30.5	1.65	15 5.0
29	3 36 5.12	0.375	16 54 50.2	1.71	15 0.9
30	3 35 55.93	0.391	16 54 8.6	1.76	14 56.9
31	3 35 46.35	− 0.408	+ 16 53 25.8	− 1.81	14 52.8
32	3 35 36.38	− 0.424	+ 16 52 41.8	− 1.86	14 48.7

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	8″.8	9″.0	9″.1	9″.3
Horizontal Parallax . .	1.0	1.0	1.0	1.0

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 35 46.35	− 0.408	+ 16 53 25.8	− 1.81	14 52.8
2	3 35 36.38	0.424	16 52 41.8	1.86	14 48.7
3	3 35 26.02	0.440	16 51 56.6	1.91	14 44.5
4	3 35 15.27	0.456	16 51 10.3	1.95	14 40.4
5	3 35 4.15	0.471	16 50 22.8	2.00	14 36.3
6	3 34 52.66	− 0.486	+ 16 49 34.2	− 2.05	14 32.2
7	3 34 40.80	0.502	16 48 44.4	2.10	14 28.1
8	3 34 28.57	0.517	16 47 53.6	2.14	14 23.9
9	3 34 15.99	0.532	16 47 1.7	2.19	14 19.8
10	3 34 3.06	0.546	16 46 8.7	2.23	14 15.6
11	3 33 49.79	− 0.560	+ 16 45 14.7	− 2.27	14 11.5
12	3 33 36.17	0.574	16 44 19.7	2.31	14 7.3
13	3 33 22.23	0.588	16 43 23.7	2.35	14 3.1
14	3 33 7.97	0.601	16 42 26.8	2.39	13 59.0
15	3 32 53.39	0.614	16 41 28.9	2.43	13 54.8
16	3 32 38.51	− 0.626	+ 16 40 30.1	− 2.47	13 50.6
17	3 32 23.33	0.638	16 39 30.5	2.51	13 46.4
18	3 32 7.86	0.650	16 38 30.0	2.54	13 42.2
19	3 31 52.11	0.662	16 37 28.7	2.57	13 38.0
20	3 31 36.08	0.673	16 36 26.6	2.60	13 33.8
21	3 31 19.79	− 0.684	+ 16 35 23.8	− 2.63	13 29.6
22	3 31 3.25	0.694	16 34 20.2	2.66	13 25.4
23	3 30 46 46	0.704	16 33 16.0	2.69	13 21.2
24	3 30 29.44	0.714	16 32 11.1	2.72	13 17.0
25	3 30 12.19	0.723	16 31 5.6	2.75	13 12.8
26	3 29 54.72	− 0.732	+ 16 29 59.5	− 2.77	13 8.6
27	3 29 37.04	0.741	16 28 52.8	2.79	13 4.3
28	3 29 19.16	0.749	16 27 45.6	2.81	13 0.1
29	3 29 1.08	0.757	16 26 37.8	2.83	12 55.9
30	3 28 42.83	0.764	16 25 29.6	2.85	12 51.6
31	3 28 24.40	− 0.771	+ 16 24 21.0	− 2.87	12 47.4
32	3 28 5.81	− 0.778	+ 16 23 12.0	− 2.88	12 43.2

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9″.3	9″.4	9″.5	9″.6
Horizontal Parallax . .	1.0	1.1	1.1	1.1

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 28 5.81	– 0.778	+ 16 23 12.0	– 2.88	12 43.2
2	3 27 47.06	0.784	16 22 2.7	2.90	12 38.9
3	3 27 28.17	0.790	16 20 53.0	2.91	12 34.7
4	3 27 9.15	0.795	16 19 43.1	2.92	12 30.4
5	3 26 50.00	0.800	16 18 32.9	2.93	12 26.2
6	3 26 30.74	– 0.805	+ 16 17 22.5	– 2.94	12 21.9
7	3 26 11.38	0.809	16 16 11.9	2.94	12 17.7
8	3 25 51.93	0.812	16 15 1.2	2.95	12 13.4
9	3 25 32.40	0.815	16 13 50.4	2.95	12 9.2
10	3 25 12.81	0.817	16 12 39.6	2.95	12 4.9
11	3 24 53.17	– 0.819	+ 16 11 28.8	– 2.95	12 0.6
12	3 24 33.48	0.821	16 10 18.1	2.95	11 56.4
13	3 24 13.76	0.822	16 9 7.5	2.94	11 52.1
14	3 23 54.02	0.823	16 7 57.0	2.93	11 47.9
15	3 23 34.27	0.823	16 6 46.7	2.92	11 43.6
16	3 23 14.53	– 0.822	+ 16 5 36.6	– 2.91	11 39.3
17	3 22 54.80	0.821	16 4 26.8	2.90	11 35.1
18	3 22 35.10	0.820	16 3 17.2	2.89	11 30.8
19	3 22 15.44	0.818	16 2 8.0	2.88	11 26.6
20	3 21 55.83	0.816	16 0 59.1	2.86	11 22.3
21	3 21 36.28	– 0.813	+ 15 59 50.7	– 2.84	11 18.0
22	3 21 16.80	0.810	15 58 42.7	2.82	11 13.8
23	3 20 57.40	0.806	15 57 35.3	2.80	11 9.5
24	3 20 38.10	0.802	15 56 28.4	2.78	11 5.3
25	3 20 18.90	0.798	15 55 22.2	2.75	11 1.0
26	3 19 59.81	– 0.793	+ 15 54 16.6	– 2.72	10 56.8
27	3 19 40.85	0.787	15 53 11.7	2.69	10 52.6
28	3 19 22.02	0.781	15 52 7.4	2.66	10 48.3
29	3 19 3.34	0.775	15 51 3.9	2.63	10 44.1
30	3 18 44.81	0.769	15 50 1.1	2.60	10 39.8
31	3 18 26.44	– 0.762	+ 15 48 59.2	– 2.56	10 35.6
32	3 18 8.25	– 0.754	+ 15 47 58.2	– 2.52	10 31.4

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9″.6	9″.6	9″.6	9″.5
Horizontal Parallax . .	1.1	1.1	1.1	1.1

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 18 26.44	– 0.762	+ 15 48 59.2	– 2.56	10 35.6
2	3 18 8.25	0.754	15 47 58.2	2.52	10 31.4
3	3 17 50.24	0.746	15 46 58.1	2.48	10 27.1
4	3 17 32.43	0.738	15 45 59.0	2.44	10 22.9
5	3 17 14.82	0.729	15 45 0.9	2.40	10 18.7
6	3 16 57.42	– 0.720	+ 15 44 3.8	– 2.36	10 14.5
7	3 16 40.25	0.710	15 43 7.8	2.31	10 10.3
8	3 16 23.32	0.700	15 42 12.9	2.27	10 6.0
9	3 16 6.64	0.690	15 41 19.1	2.22	10 1.8
10	3 15 50.21	0.679	15 40 26.5	2.17	9 57.6
11	3 15 34.05	– 0.667	+ 15 39 35.1	– 2.11	9 53.4
12	3 15 18.17	0.656	15 38 45.0	2.06	9 49.2
13	3 15 2.56	0.644	15 37 56.2	2.01	9 45.1
14	3 14 47.25	0.632	15 37 8.7	1.96	9 40.9
15	3 14 32.24	0.619	15 36 22.5	1.90	9 36.7
16	3 14 17.54	– 0.606	+ 15 35 37.7	– 1.84	9 32.5
17	3 14 3.15	0.593	15 34 54.3	1.78	9 28.4
18	3 13 49.08	0.579	15 34 12.4	1.72	9 24.2
19	3 13 35.34	0.565	15 33 32.0	1.65	9 20.0
20	3 13 21.94	0.551	15 32 53.0	1.59	9 15.9
21	3 13 8.88	– 0.537	+ 15 32 15.5	– 1.53	9 11.7
22	3 12 56.18	0.522	15 31 39.6	1.47	9 7.6
23	3 12 43.83	0.507	15 31 5.3	1.40	9 3.5
24	3 12 31.85	0.492	15 30 32.5	1.33	8 59.3
25	3 12 20.23	0.476	15 30 1.4	1.26	8 55.2
26	3 12 8.99	– 0.461	+ 15 29 31.9	– 1.19	8 51.1
27	3 11 58.12	0.445	15 29 4.1	1.12	8 47.0
28	3 11 47.63	0.429	15 28 37.9	1.05	8 42.9
29	3 11 37.53	0.413	15 28 13.4	0.98	8 38.8
30	3 11 27.82	0.396	15 27 50.7	0.91	8 34.7
31	3 11 18.51	– 0.379	+ 15 27 29.7	– 0.84	8 30.6
32	3 11 9.61	– 0.362	+ 15 27 10.3	– 0.77	8 26.5

Day of the Month.	1st.	11th.	21st.	31st.
Polar Semidiameter . .	9″.5	9″.5	9″.4	9″.2
Horizontal Parallax . .	1.1	1.1	1.1	1.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 0	11 19 6.57	−1.540	+ 5 15 35.0	+12.55	16 36.2	July 3	11 6 38.21	+7.834	+ 6 31 58.0	−51.44	4 20.3
4	11 18 58.80	2.347	5 16 35.2	17.60	16 20.3	7	11 7 10.82	8.470	6 28 24.4	55.39	4 5.1
8	11 18 47.82	3.140	5 17 55.6	22.57	16 4.4	11	11 7 45.93	9.081	6 24 35.2	59.17	3 50.0
12	11 18 33.71	3.914	5 19 35.5	27.39	15 48.4	15	11 8 23.44	9.665	6 20 31.3	62.76	3 34.9
16	11 18 16.55	4.661	5 21 34.3	32.01	15 32.4	19	11 9 3.20	10.214	6 16 13.4	66.13	3 19.8
20	11 17 56.47	−5.374	+ 5 23 51.2	+36.39	15 16.3	23	11 9 45.09	10.725	+ 6 11 42.5	−69.28	3 4.8
24	11 17 33.62	6.044	5 26 25.1	40.49	15 0.2	27	11 10 28.95	11.200	6 6 59.4	72.22	2 49.8
28	11 17 8.18	6.668	5 29 14.7	44.27	14 44.1	31	11 11 14.65	11.641	6 2 5.0	74.95	2 34.8
Feb. 1	11 16 40.34	7.244	5 32 18.8	47.72	14 27.9	Aug. 4	11 12 2.04	12.050	5 57 0.1	77.47	2 19.9
5	11 16 10.30	7.768	5 35 36.0	50.84	14 11.6	8	11 12 51.00	12.424	5 51 45.5	79.77	2 5.0
9	11 15 38.27	−8.239	+ 5 39 5.0	+53.61	13 55.4	12	11 13 41.38	12.759	+ 5 46 22.2	−81.83	1 50.1
13	11 15 4.47	8.653	5 42 44.4	56.00	13 39.1	16	11 14 33.02	13.059	5 40 51.2	83.63	1 35.2
17	11 14 29.14	9.002	5 46 32.4	57.95	13 22.8	20	11 15 25.76	13.309	5 35 13.5	85.16	1 20.3
21	11 13 52.54	9.283	5 50 27.4	59.45	13 6.5	24	11 16 19.43	13.519	5 29 30.2	86.44	1 5.5
25	11 13 14.96	9.494	5 54 27.5	60.51	12 50.1	28	11 17 13.86	13.689	5 23 42.3	87.46	0 50.7
Mar. 1	11 12 36.68	−9.635	+ 5 58 30.9	+61.14	12 33.8	Sept. 1	11 18 8.89	13.820	+ 5 17 50.8	−88.24	0 35.8
5	11 11 57.97	9.709	6 2 36.0	61.33	12 17.4	5	11 19 4.37	13.915	5 11 56.7	88.77	0 21.0
9	11 11 19.10	9.715	6 6 41.0	61.09	12 1.0	9	11 20 0.15	13.969	5 6 0.9	89.03	0 6.2
13	11 10 40.34	9.655	6 10 44.2	60.43	11 44.6	13	11 20 56.06	13.976	5 0 4.8	89.01	23 47.7
17	11 10 1.95	9.526	6 14 43.9	59.35	11 28.2	17	11 21 51.90	13.936	4 54 9.3	88.69	23 32.9
21	11 9 24.22	−9.325	+ 6 18 38.4	+57.80	11 11.8	21	11 22 47.49	13.852	+ 4 48 15.7	−88.09	23 18.1
25	11 8 47.44	9.054	6 22 25.8	55.82	10 55.5	25	11 23 42.66	13.729	4 42 24.9	87.22	23 3.3
29	11 8 11.88	8.720	6 26 4.5	53.48	10 39.2	29	11 24 37.26	13.565	4 36 38.2	86.08	22 48.5
Apr. 2	11 7 37.76	8.330	6 29 33.2	50.81	10 23.0	Oct. 3	11 25 31.12	13.360	4 30 56.6	84.69	22 33.7
6	11 7 5.31	7.887	6 32 50.5	47.81	10 6.7	7	11 26 24.08	13.111	4 25 21.1	83.01	22 18.8
10	11 6 34.73	−7.393	+ 6 35 55.3	+44.50	9 50.5	11	11 27 15.95	12.817	+ 4 19 52.9	−81.04	22 4.0
14	11 6 6.23	6.847	6 38 46.2	40.89	9 34.3	15	11 28 6.56	12.479	4 14 33.1	78.77	21 49.1
18	11 5 40.01	6.253	6 41 22.1	36.99	9 18.1	19	11 28 55.72	12.097	4 9 23.0	76.23	21 34.1
22	11 5 16.26	5.615	6 43 41.8	32.85	9 2.0	23	11 29 43.28	11.675	4 4 23.6	73.43	21 19.2
26	11 4 55.14	4.942	6 45 44.6	28.50	8 45.9	27	11 30 29.07	11.214	3 59 35.9	70.39	21 4.2
30	11 4 36.76	−4.242	+ 6 47 29.7	+24.02	8 29.9	31	11 31 12.94	10.717	+ 3 55 0.8	−67.11	20 49.2
May 4	11 4 21.23	3.519	6 48 56.6	19.41	8 13.9	Nov. 4	11 31 54.76	10.182	3 50 39.4	63.57	20 34.2
8	11 4 8.64	2.773	6 50 4.8	14.66	7 58.0	8	11 32 34.35	9.605	3 46 32.6	59.76	20 19.1
12	11 3 59.07	2.005	6 50 53.7	9.80	7 42.1	12	11 33 11.55	8.989	3 42 41.6	55.70	20 4.0
16	11 3 52.61	1.222	6 51 23.1	+ 4.86	7 26.2	16	11 33 46.22	8.340	3 39 7.3	51.43	19 48.8
20	11 3 49.30	−0.429	+ 6 51 32.6	− 0.13	7 10.5	20	11 34 18.23	+7.660	+ 3 35 50.4	−46.98	19 33.6
24	11 3 49.18	+0.369	6 51 22.1	5.13	6 54.8	24	11 34 47.46	6.953	3 32 51.7	42.35	19 18.4
28	11 3 52.25	1.166	6 50 51.6	10.09	6 39.1	28	11 35 13.81	6.219	3 30 11.8	37.56	19 3.1
June 1	11 3 58.50	1.957	6 50 1.4	15.02	6 23.4	Dec. 2	11 35 37.17	5.459	3 27 51.5	32.60	18 47.7
5	11 4 7.90	2.741	6 48 51.5	19.90	6 7.9	6	11 35 57.45	4.677	3 25 51.2	27.49	18 32.3
9	11 4 20.42	3.517	6 47 22.2	24.73	5 52.4	10	11 36 14.56	3.873	3 24 11.7	22.25	18 16.9
13	11 4 36.03	+4.286	+ 6 45 33.7	−29.51	5 36.9	14	11 36 28.41	+3.050	+ 3 22 53.3	−16.93	18 1.4
17	11 4 54.69	5.041	6 43 26.3	34.19	5 21.5	18	11 36 38.95	2.220	3 21 56.3	11.57	17 45.8
21	11 5 16.33	5.776	6 41 0.4	38.73	5 6.1	22	11 36 46.17	1.389	3 21 20.7	6.19	17 30.1
25	11 5 40.86	6.487	6 38 16.7	43.11	4 50.8	26	11 36 50.06	+0.556	3 21 6.7	− 0.82	17 14.5
29	11 6 8.19	7.173	6 35 15.7	47.35	4 35.5	30	11 36 50.62	−0.276	3 21 14.2	+ 4.53	16 58.8
July 3	11 6 38.21	+7.834	+ 6 31 58.0	−51.44	4 20.3	34	11 36 47.85	−1.107	+ 3 21 43.0	+ 9.86	16 43.0

Greatest horizontal parallax, March 8, 0″.51.
Greatest semidiameter, March 8, 1″.94.

Least horizontal parallax, September 9, 0″.46.
Least semidiameter, September 9, 1″.74.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 0	2 48 5.25	−3.129	+14 18 6.0	−10.56	8 6.6	July 3	3 4 53.10	+6.082	+15 35 13.1	+22.37	20 16.0
4	2 47 53.72	2.634	14 17 28.3	8.28	7 50.6	7	3 5 16.64	5.681	15 36 39.0	20.53	20 0.7
8	2 47 44.19	2.126	14 16 59.9	5.90	7 34.7	11	3 5 38.54	5.261	15 37 57.3	18.62	19 45.3
12	2 47 36.72	1.606	14 16 41.1	3.45	7 18.9	15	3 5 58.72	4.824	15 39 7.9	16.66	19 29.9
16	2 47 31.35	1.073	14 16 32.3	− 0.99	7 3.1	19	3 6 17.12	4.369	15 40 10.6	14.66	19 14.5
20	2 47 28.14	−0.530	+14 16 33.3	+ 1.50	6 47.3	23	3 6 33.66	+3.898	+15 41 5.2	+12.61	18 59.0
24	2 47 27.11	+0.018	14 16 44.3	4.00	6 31.6	27	3 6 48.29	3.413	15 41 51.5	10.53	18 43.5
28	2 47 28.28	0.567	14 17 5.3	6.51	6 15.9	31	3 7 0.95	2.916	15 42 29.4	8.42	18 28.0
Feb. 1	2 47 31.64	1.115	14 17 36.4	9.00	6 0.2	Aug. 4	3 7 11.60	2.409	15 42 58.8	6.28	18 12.4
5	2 47 37.20	1.661	14 18 17.3	11.44	5 44.6	8	3 7 20.21	1.893	15 43 19.6	4.11	17 56.8
9	2 47 44.94	+2.201	+14 19 7.9	+13.84	5 28.9	12	3 7 26.74	+1.369	+15 43 31.7	+ 1.93	17 41.2
13	2 47 54.82	2.732	14 20 8.0	16.18	5 13.4	16	3 7 31.16	0.838	15 43 35.0	− 0.25	17 25.6
17	2 48 6.81	3.254	14 21 17.3	18.43	4 57.9	20	3 7 33.44	+0.306	15 43 29.6	2.41	17 9.9
21	2 48 20.87	3.764	14 22 35.4	20.60	4 42.3	24	3 7 33.60	−0.228	15 43 15.7	4.54	16 54.1
25	2 48 36.94	4.259	14 24 2.0	22.68	4 26.9	28	3 7 31.66	0.745	15 42 53.3	6.64	16 38.4
Mar. 1	2 48 54.95	+4.736	+14 25 36.7	+24.66	4 11.5	Sept. 1	3 7 27.64	−1.264	+15 42 22.6	− 8.69	16 22.6
5	2 49 14.82	5.191	14 27 19.2	26.55	3 56.1	5	3 7 21.55	1.776	15 41 43.8	10.70	16 6.7
9	2 49 36.46	5.623	14 29 9.0	28.31	3 40.7	9	3 7 13.43	2.277	15 40 57.0	12.65	15 50.8
13	2 49 59.80	6.034	14 31 5.6	29.95	3 25.4	13	3 7 3.33	2.766	15 40 2.6	14.54	15 34.9
17	2 50 24.74	6.426	14 33 8.5	31.48	3 10.1	17	3 6 51.29	3.241	15 39 0.7	16.36	15 19.0
21	2 50 51.20	+6.796	+14 35 17.3	+32.86	2 54.8	21	3 6 37.38	−3.695	+15 37 51.7	−18.09	15 3.1
25	2 51 19.09	7.141	14 37 31.3	34.09	2 39.5	25	3 6 21.71	4.124	15 36 36.0	19.70	14 47.1
29	2 51 48.31	7.456	14 39 49.9	35.19	2 24.2	29	3 6 4.38	4.525	15 35 14.1	21.19	14 31.1
Apr. 2	2 52 18.72	7.740	14 42 12.7	36.16	2 9.0	Oct. 3	3 5 45.49	4.909	15 33 46.5	22.58	14 15.0
6	2 52 50.21	7.994	14 44 39.1	36.99	1 53.8	7	3 5 25.13	5.259	15 32 13.5	23.86	13 59.0
10	2 53 22.65	+8.217	+14 47 8.5	+37.68	1 38.7	11	3 5 3.44	−5.574	+15 30 35.6	−25.00	13 42.9
14	2 53 55.92	8.411	14 49 40.4	38.22	1 23.5	15	3 4 40.56	5.854	15 28 53.5	25.98	13 26.8
18	2 54 29.92	8.577	14 52 14.2	38.63	1 8.3	19	3 4 16.63	6.100	15 27 7.9	26.78	13 10.6
22	2 55 4.53	8.714	14 54 49.3	38.89	0 53.2	23	3 3 51.78	6.309	15 25 19.4	27.43	12 54.5
26	2 55 39.63	8.821	14 57 25.2	39.01	0 38.0	27	3 3 26.17	6.476	15 23 28.6	27.90	12 38.3
30	2 56 15.09	+8.896	+15 0 1.3	+38.99	0 22.9	31	3 2 59.99	−6.602	+15 21 36.3	−28.19	12 22.2
May 4	2 56 50.78	8.940	15 2 37.0	38.81	0 7.7	Nov. 4	3 2 33.39	6.688	15 19 43.2	28.31	12 6.0
8	2 57 26.59	8.954	15 5 11.7	38.51	23 48.8	8	3 2 6.52	6.731	15 17 50.0	28.28	11 49.8
12	2 58 2.39	8.937	15 7 45.0	38.10	23 33.7	12	3 1 39.57	6.729	15 15 57.2	28.04	11 33.6
16	2 58 38.07	8.890	15 10 16.4	37.56	23 18.6	16	3 1 12.72	6.681	15 14 5.8	27.61	11 17.5
20	2 59 13.50	+8.811	+15 12 45.4	+36.90	23 3.4	20	3 0 46.15	−6.589	+15 12 16.4	−27.01	11 1.4
24	2 59 48.54	8.701	15 15 11.5	36.10	22 48.3	24	3 0 20.04	6.455	15 10 29.8	26.21	10 45.2
28	3 0 23.08	8.561	15 17 34.1	35.19	22 33.1	28	2 59 54.54	6.280	15 8 46.8	25.24	10 29.0
June 1	3 0 57.01	8.393	15 19 52.9	34.16	22 18.0	Dec. 2	2 59 29.82	6.066	15 7 8.0	24.10	10 12.9
5	3 1 30.20	8.197	15 22 7.3	33.01	22 2.8	6	2 59 6.03	5.811	15 5 34.1	22.80	9 56.8
9	3 2 2.56	7.974	15 24 16.9	31.76	21 47.6	10	2 58 43.35	5.517	15 4 5.8	21.33	9 40.6
13	3 2 33.97	+7.724	+15 26 21.4	+30.42	21 32.4	14	2 58 21.92	−5.187	+15 2 43.7	−19.72	9 24.6
17	3 3 4.33	7.446	15 28 20.3	28.99	21 17.1	18	2 58 1.87	4.822	15 1 28.2	17.99	9 8.5
21	3 3 33.52	7.141	15 30 13.3	27.46	21 1.9	22	2 57 43.36	4.427	15 0 19.9	16.12	8 52.5
25	3 4 1.44	6.813	15 32 0.0	25.84	20 46.6	26	2 57 26.48	4.004	14 59 19.3	14.11	8 36.5
29	3 4 28.60	6.460	15 33 40.0	24.14	20 31.3	30	2 57 11.35	3.553	14 58 27.1	11.96	8 20.5
July 3	3 4 53.10	+6.082	+15 35 13.1	+22.37	20 16.0	34	2 56 58.08	−3.076	+14 57 43.7	− 9.67	8 4.6

Least horizontal parallax, May 8, 0″.29.
Least semidiameter, May 8, 1″.25.

Greatest horizontal parallax, November 10, 0″.31.
Greatest semidiameter, November 10, 1″.34.

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 0	268 26 6.7	2 47 29.6	+ 12 46.8	− 4 39 13.6	− 15 16.9	9.6661434	0.1581800	0.1582597
2	274 3 18.3	2 50 3.5	12 49.6	5 8 38.1	14 4.3	9.6631634	0.1581704	0.1579108
4	279 46 29.5	2 53 30.2	12 22.6	5 35 29.5	12 43.2	9.6591291	0.1574784	0.1568701
6	285 37 28.7	2 57 52.9	11 24.5	5 59 29.1	11 11.8	9.6540324	0.1560824	0.1551113
8	291 38 10.9	3 3 15.0	9 55.2	6 20 14.4	9 27.7	9.6478663	0.1539517	0.1525976
10	297 50 39.1	3 9 40.8	+ 7 55.8	− 6 37 17.3	− 7 28.4	9.6406259	0.1510426	0.1492796
12	304 17 5.8	3 17 15.8	5 28.8	6 50 4.8	5 10.7	9.6323121	0.1473003	0.1450954
14	310 59 54.5	3 26 5.1	+ 2 38.2	6 57 56.6	− 2 31.3	9.6229358	0.1426545	0.1399665
16	318 1 39.6	3 36 14.5	− 0 29.4	7 0 5.7	+ 0 33.8	9.6125248	0.1370192	0.1337991
18	325 25 6.8	3 47 49.1	3 44.6	6 55 36.8	4 8.1	9.6011309	0.1302915	0.1264802
20	333 13 10.8	4 0 52.3	− 6 54.5	− 6 43 27.8	+ 8 15.0	9.5888418	0.1223482	0.1178773
22	341 28 50.7	4 15 24.5	9 42.4	6 22 31.1	12 56.2	9.5757950	0.1130470	0.1078364
24	350 15 2.9	4 31 21.3	11 48.0	5 51 37.6	18 10.0	9.5621958	0.1022236	0.0961856
26	359 34 27.7	4 48 30.1	12 49.3	5 9 46.6	23 50.0	9.5483368	0.0896988	0.0827397
28	9 29 11.1	5 6 27.0	12 26.2	4 16 15.7	29 41.8	9.5346132	0.0752845	0.0673110
30	20 0 17.0	5 24 33.0	− 10 25.1	− 3 11 1.4	+ 35 20.9	9.5215364	0.0587992	0.0497318
Feb. 1	31 7 15.0	5 41 52.2	6 46.1	1 55 0.1	40 12.0	9.5097224	0.0400959	0.0298846
3	42 47 26.2	5 57 13.9	− 1 51.2	− 0 30 28.7	43 31.7	9.4998572	0.0190969	0.0077489
5	54 55 36.0	6 9 15.4	+ 3 33.6	+ 0 58 44.4	44 37.1	9.4926211	9.9958572	9.9834586
7	67 23 41.5	6 16 38.9	8 27.3	2 27 32.9	42 58.9	9.4885827	9.9706050	9.9573633
9	80 1 17.6	6 18 28.5	+ 11 47.5	+ 3 50 12.4	+ 38 32.8	9.4880875	9.9438193	9.9300771
11	92 36 36.4	6 14 22.3	12 51.9	5 1 20.5	31 45.0	9.4911768	9.9162597	9.9025070
13	104 57 51.4	6 4 43.8	11 32.3	5 56 57.4	23 26.4	9.4975864	9.8889750	9.8758321
15	116 54 47.0	5 50 35.9	8 15.3	6 35 1.0	14 37.1	9.5067962	9.8632528	9.8514159
17	128 19 44.6	5 33 23.4	+ 3 47.5	6 55 29.5	+ 6 10.3	9.5181457	9.8404961	9.8306547
19	139 8 4.4	5 14 33.5	− 0 59.6	+ 6 59 51.8	− 1 17.8	9.5309416	9.8220341	9.8147519
21	149 17 55.0	4 55 22.6	5 22.1	6 50 30.8	7 29.2	9.5445434	9.8088921	9.8045026
23	158 49 40.8	4 36 48.3	8 52.5	6 30 7.8	12 21.4	9.5584094	9.8015930	9.8001364
25	167 45 20.4	4 19 27.0	11 18.0	6 1 17.4	16 0.6	9.5721128	9.8000728	9.8013140
27	176 7 44.5	4 3 39.0	12 35.8	5 26 16.2	18 37.4	9.5853345	9.8037518	9.8072636
Mar. 1	184 0 13.3	3 49 32.9	− 12 50.4	+ 4 46 56.0	− 20 24.1	9.5978476	9.8117192	9.8169879
3	191 26 13.1	3 37 8.8	12 11.0	4 4 46.0	21 31.5	9.6094979	9.8229427	9.8294644
5	198 29 4.8	3 26 22.3	10 48.3	3 20 55.0	22 8.8	9.6201849	9.8364428	9.8437792
7	205 11 57.5	3 17 6.9	8 52.7	2 36 15.0	22 23.3	9.6298487	9.8513854	9.8591854
9	211 37 46.5	3 9 15.4	6 34.4	1 51 24.6	22 21.2	9.6384555	9.8671138	9.8751150
11	217 49 11.7	3 2 40.2	− 4 2.4	+ 1 6 52.0	− 22 6.8	9.6459909	9.8831431	9.8911593
13	223 48 38.9	2 57 14.9	− 1 24.3	+ 0 22 59.2	21 42.6	9.6524514	9.8991319	9.9070356
15	229 38 22.1	2 52 53.7	+ 1 13.1	− 0 19 57.0	21 11.2	9.6578409	9.9148504	9.9225596
17	235 20 23.6	2 49 31.7	3 44.2	1 1 44.5	20 34.2	9.6621655	9.9301517	9.9376174
19	240 56 38.0	2 47 5.2	6 4.1	1 42 13.0	19 52.4	9.6654336	9.9449502	9.9521452
21	246 28 53.2	2 45 31.1	+ 8 8.4	− 2 21 13.5	− 19 6.4	9.6676528	9.9591997	9.9661123
23	251 58 50.9	2 44 47.3	9 53.8	2 58 37.7	18 16.1	9.6688282	9.9728827	9.9795113
25	257 28 10.7	2 44 52.9	11 17.1	3 34 17.1	17 21.3	9.6689630	9.9859991	9.9923475
27	262 58 30.6	2 45 47.4	12 15.6	4 8 2.2	16 21.5	9.6680574	9.9985584	0.0046341
29	268 31 28.5	2 47 31.4	12 47.0	4 39 42.2	15 15.8	9.6661090	0.0105769	0.0163887
31	274 8 44.5	2 50 6.1	+ 12 49.5	− 5 9 4.2	− 14 3.1	9.6631129	0.0220713	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
April 0	274 8 44.5	2 50 6.1	+ 12 49.5	− 5 9 4.2	− 14 3.1	9.6631129	0.0220713	0.0276268
2	279 52 1.7	2 53 33.8	12 21.9	5 35 53.2	12 41.8	9.6590626	0.0330573	0.0383639
4	285 43 8.8	2 57 57.3	11 23.3	5 59 50.2	11 10.0	9.6539495	0.0435475	0.0486090
6	291 44 0.7	3 3 20.2	9 53.5	6 20 32.1	9 25.9	9.6477671	0.0535489	0.0583667
8	297 56 40.5	3 9 47.2	7 53.7	6 37 31.3	7 26.4	9.6405101	0.0630617	0.0676328
10	304 23 21.1	3 17 23.2	+ 5 26.3	− 6 50 14.5	− 5 8.5	9.6321797	0.0720779	0.0763944
12	311 6 25.9	3 26 13.8	+ 2 35.4	6 58 1.6	− 2 28.6	9.6227871	0.0805789	0.0846272
14	318 8 29 6	3 36 24.5	− 0 32.4	7 0 4.9	+ 0 36.9	9.6123603	0.0885344	0.0922950
16	325 32 18.1	3 48 0.4	3 47.6	6 55 29.2	4 11.7	9.6009514	0.0959015	0.0993156
18	333 20 46.2	4 1 5.0	6 57.3	6 43 12.6	8 19.1	9.5886489	0.1026182	0.1057086
20	341 36 53.0	4 15 38.6	− 9 44.7	− 6 22 7.1	+ 13 0.7	9.5755914	0.1086046	0.1112935
22	350 23 34.6	4 31 36.7	11 49.3	5 51 3.9	18 15.2	9.5619856	0.1137603	0.1159886
24	359 43 31.6	4 48 46.4	12 49.7	5 9 2.3	23 55.5	9.5481245	0.1179606	0.1196570
26	9 38 48.1	5 6 43.8	12 25.0	4 15 20.8	29 47.3	9.5344060	0.1210576	0.1221412
28	20 10 28.0	5 24 49.6	10 22.4	3 9 55.7	35 25.9	9.5213428	0.1228849	0.1232657
30	31 17 58.9	5 42 7.8	− 6 42.1	− 1 53 45.3	+ 40 15.9	9.5095531	0.1232612	0.1228489
May 2	42 58 39.7	5 57 26.6	− 1 46.6	− 0 20 7.6	43 33.8	9.4997228	0.1220077	0.1207181
4	55 7 12.0	6 9 24.6	+ 3 38.5	+ 1 0 7.6	44 37.0	9.4925313	0.1189639	0.1167316
6	67 35 32.0	6 16 44.0	8 31.2	2 28 53.3	42 56.2	9.4885449	0.1140122	0.1108010
8	80 13 12.1	6 18 27.6	11 49.5	3 51 24.6	38 27.5	9.4881046	0.1070977	0.1029072
10	92 48 23.4	6 14 16.0	+ 12 51.7	+ 5 2 19.8	+ 31 37.8	9.4912487	0.0982390	0.0931070
12	105 9 20.9	6 4 33.0	11 30.1	5 57 41.0	23 18.4	9.4977050	0.0875286	0.0815248
14	117 5 50.6	5 50 21.5	8 11.6	6 35 28.2	14 29.0	9.5069528	0.0751180	0.0683333
16	128 30 16.3	5 33 6.6	+ 3 43.1	6 55 40.7	+ 6 2.8	9.5183297	0.0611965	0.0537332
18	139 18 1.0	5 14 15.9	− 1 3.4	6 59 49.0	− 1 24.1	9.5311428	0.0459693	0.0379300
20	149 27 16.5	4 55 5.4	− 5 25.8	+ 6 50 16.9	− 7 34.4	9.5447527	0.0296399	0.0211219
22	158 58 28.8	4 36 31.7	8 56.2	6 29 44.4	12 25.4	9.5586195	0.0123980	0.0034896
24	167 53 35.4	4 19 11.5	11 20.2	6 0 47.3	16 3.4	9.5723182	9.9944167	9.9851975
26	176 15 30.3	4 3 25.2	12 36.6	5 25 41.0	18 39.6	9.5855309	9.9758506	9.9663938
28	184 7 32.9	3 49 20.6	12 50.2	4 46 17.5	20 25.5	9.5980324	9.9568438	9.9472169
30	191 33 9.7	3 36 58.0	− 12 10.1	+ 4 4 5.6	− 21 32.3	9.6096691	9.9375297	9.9277990
June 1	198 35 41.1	3 26 13.0	10 46.6	3 20 13.4	22 9.2	9.6203413	9.9180421	9.9082764
3	205 18 16.7	3 16 59.0	8 50.6	2 35 32.8	22 23.5	9.6299895	9.8985205	9.8887943
5	211 43 51.0	3 9 6.9	6 32.1	1 50 42.1	22 21.2	9.6385803	9.8791188	9.8695164
7	217 55 3.9	3 2 34.6	4 0.0	1 6 10.2	22 6.3	9.6460994	9.8600119	9.8506322
9	223 54 21.2	2 57 10.1	− 1 21.8	+ 0 22 18.4	− 21 42.0	9.6525438	9.8414061	9.8323650
11	229 43 56.0	2 52 50.1	+ 1 15.5	− 0 20 36.7	21 10.6	9.6579168	9.8235425	9.8149759
13	235 25 51.1	2 49 29.0	3 46.6	1 2 23.0	20 33.6	9.6622254	9.8067048	9.7987724
15	241 2 1.0	2 47 3.3	6 6.2	1 42 50.2	19 51.8	9.6654775	9.7912235	9.7841053
17	246 34 13.1	2 45 30.0	8 10.3	2 21 49.4	19 5.7	9.6676805	9.7774673	9.7713606
19	252 4 9.5	2 44 47.1	9 55.4	2 59 12.1	18 15.8	9.6688399	9.7658363	9.7609457
21	257 33 29.6	2 44 53.4	+ 11 18.3	− 3 34 49.7	− 17 20.4	9.6689584	9.7567382	9.7532612
23	263 3 51.3	2 45 48.7	12 16.3	4 8 32.8	16 20 5	9.6680365	9.7505587	9.7486693
25	268 36 52.5	2 47 33.4	12 47.4	4 40 10.7	15 14 8	9.6660718	9.7476248	9.7474493
27	274 14 13.3	2 50 8.9	12 49.5	5 9 30.6	14 1.9	9.6630592	9.7481607	9.7497660
29	279 57 37.0	2 53 37.4	12 21.3	5 36 16.9	12 40.5	9.6589921	9.7522630	9.7556412
31	285 48 52.2	2 58 1.8	+ 11 22.1	− 6 0 10.8	− 11 8.7	9.6538623	9.7598812	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ″ ′	′ ″	° ′ ″	′ ″			
July 1	285 48 52.2	2 58 1.8	+ 11 22.1	− 6 0 10.8	− 11 8.7	9.6538623	9.7598812	9.7649539
3	291 49 54.1	3 3 25.7	9 52.0	6 20 49.6	9 24.2	9.6476631	9.7708241	9.7774499
5	298 2 45.9	3 9 53.8	7 51.7	6 37 46.2	7 24.4	9.6403893	9.7847835	9.7927742
7	304 29 40.6	3 17 30.9	5 23.8	6 50 24.1	5 6.1	9.6320422	9.8013679	9.8105088
9	311 13 2.0	3 26 22.6	+ 2 32.5	6 58 6.1	− 2 26.0	9.6226331	9.8201410	9.8302092
11	318 15 24.6	3 36 34.6	− 0 35.4	− 7 0 3.8	+ 0 30.8	9.6121906	9.8406584	9.8514348
13	325 39 34.6	3 48 11.8	3 50.6	6 55 21.9	4 15.2	9.6007668	9.8624875	9.8737660
15	333 28 26.8	4 1 17.8	7 0.1	6 42 57.4	8 23.4	9.5884516	9.8852223	9.8968110
17	341 45 0.6	4 15 52.8	9 47.0	6 21 42.8	13 5.4	9.5753840	9.9084885	9.9202125
19	350 32 11.9	4 31 52.0	11 50.9	5 50 30.2	18 20.2	9.5617718	9.9319419	9.9436362
21	359 52 40.6	4 49 2.8	− 12 50.0	− 5 8 17.6	+ 24 0.9	9.5479101	9.9552558	9.9667629
23	9 48 30.7	5 7 0.6	12 23.9	4 14 24.9	29 52.6	9.5341979	9.9781201	9.9892858
25	20 20 44.3	5 25 6.2	10 19.8	3 8 49.4	35 30.9	9.5211497	0.0002312	0.0109103
27	31 28 47.2	5 42 23.1	6 38.0	1 52 29.8	40 19.7	9.5093851	0.0212889	0.0313309
29	43 9 56.6	5 57 39.4	− 1 41.6	− 0 27 46.0	43 35.9	9.4995908	0.0410018	0.0502682
31	55 18 51.4	6 9 33.7	+ 3 43.5	+ 1 1 31.4	+ 44 36.8	9.4924449	0.0591001	0.0674702
Aug. 2	67 47 24.9	6 16 48.1	8 35.2	2 30 14.0	42 53.2	9.4885116	0.0753554	0.0827370
4	80 25 8.2	6 18 26.4	11 51.6	3 52 36.7	38 22.0	9.4881264	0.0896014	0.0959411
6	93 0 11.4	6 14 9.3	12 51.6	5 3 19.0	31 30.6	9.4913246	0.1017533	0.1070407
8	105 20 50.2	6 4 21.5	11 27.9	5 58 24.2	23 10.2	9.4978286	0.1118113	0.1160771
10	117 16 53.1	5 50 6.6	+ 8 7.8	+ 6 35 54.9	+ 14 20.9	9.5071147	0.1198541	0.1231608
12	128 40 46.2	5 32 49.6	+ 3 38.7	6 55 51.5	+ 5 55.3	9.5185188	0.1260187	0.1284500
14	139 27 55.5	5 13 58.1	− 1 7.8	6 59 46.0	− 1 30.5	9.5313488	0.1304777	0.1321250
16	149 36 35.2	4 54 47.8	5 29.6	6 50 2.2	7 39.5	9.5449666	0.1334152	0.1343703
18	159 7 12.6	4 36 15.0	8 58.5	6 29 20.9	12 29.3	9.5588336	0.1350113	0.1353586
20	168 1 47.2	4 18 56.1	− 11 21.8	+ 6 0 17.0	− 16 6.3	9.5725268	0.1354312	0.1352459
22	176 23 13.0	4 3 11.4	12 37.1	5 25 5.9	18 41.5	9.5857301	0.1348181	0.1341629
24	184 14 49.6	3 49 8.4	12 50.0	4 45 39.3	20 26.8	9.5982191	0.1332933	0.1322209
26	191 40 3.3	3 36 47.4	12 9.0	4 3 25.4	21 33.0	9.6098414	0.1309556	0.1295066
28	198 42 15.3	3 26 4.0	10 45.1	3 19 32.1	22 9.6	9.6204980	0.1278822	0.1260893
30	205 24 34.2	3 16 51.2	− 8 48.7	+ 2 34 50.9	− 22 23.4	9.6301299	0.1241339	0.1220208
Sept. 1	211 49 54.0	3 9 1.8	6 29.8	1 50 0.4	22 21.0	9.6387041	0.1197539	0.1173367
3	218 0 54.4	3 2 29.0	3 57.5	1 5 29.0	22 6.0	9.6462065	0.1147713	0.1120598
5	224 0 1.5	2 57 5.8	− 1 19.3	+ 0 21 38.0	21 41.6	9.6526340	0.1092032	0.1062017
7	229 49 28.4	2 52 46.6	+ 1 17.9	− 0 21 16.3	21 10.2	9.6579905	0.1030553	0.0907632
9	235 31 17.7	2 49 26.4	+ 3 46.8	− 1 3 1.6	− 20 33.0	9.6622825	0.0963241	0.0927365
11	241 7 23.3	2 47 1.6	6 8.2	1 43 27.4	19 50.9	9.6655184	0.0889982	0.0851061
13	246 39 32.7	2 45 29.0	8 11.8	2 22 25.0	19 4.9	9.6677050	0.0810576	0.0768490
15	252 9 27.7	2 44 46.8	9 56.7	2 59 46.3	18 14.5	9.6688482	0.0724764	0.0679353
17	257 38 47.9	2 44 53.8	11 19.4	3 35 22.2	17 19 4	9.6689506	0.0632213	0.0583296
19	263 9 11.3	2 45 49.9	12 17.0	4 9 3.3	16 19.5	9.6680125	0.0532651	0.0479921
21	268 42 15.8	2 47 35.4	+ 12 47.6	− 4 40 39.3	− 15 13.7	9.6660316	0.0425350	0.0368781
23	274 19 41.5	2 50 11.9	12 49.3	5 9 56.9	14 0.7	9.6630029	0.0310156	0.0249416
25	280 3 12.1	2 53 41.2	12 20.6	5 36 40.8	12 39.2	9.6589197	0.0186499	0.0121347
27	285 54 35.6	2 58 6.3	11 21.0	6 0 31.8	11 7.2	9.6537739	0.0053911	9.9984146
29	291 55 47.2	3 3 31.2	9 50.4	6 21 7.4	9 22.5	9.6475579	9.9912013	9.9837479
31	298 8 51.2	3 10 0.4	+ 7 49.6	− 6 37 59.2	− 7 22.3	9.6402676	9.9760538	

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	298 8 51.2	3 10 0.4	+ 7 49.6	− 6 37 59.2	− 7 22.3	9.6402676	9.9760538	9.9681206
3	304 36 0.2	3 17 38.6	5 21.3	6 50 33.7	5 3.8	9.6319042	9.9599515	9.9515527
5	311 19 38.0	3 26 31.6	+ 2 29.7	6 58 10.6	− 2 23.3	9.6224791	9.9429353	9.9341174
7	318 22 19.8	3 36 44.8	− 0 38.4	7 0 2.5	+ 0 43.0	9.6120213	9.9251237	9.9159848
9	325 46 51.5	3 48 23.4	3 53.7	6 55 13.7	4 18.9	9.6005837	9.9067436	9.8974545
11	333 36 8.1	4 1 30.7	− 7 2.8	− 6 42 41.4	+ 8 27.4	9.5882561	9.8881861	9.8790244
13	341 53 9.0	4 16 7.1	9 49.0	6 21 18.3	13 10.0	9.5751789	9.8700739	9.8614576
15	350 40 50.4	4 32 7.7	11 52.2	5 49 55.9	18 25.4	9.5615610	9.8533205	9.8458299
17	0 1 51.5	4 49 19.2	12 50.3	5 7 32.7	24 6.3	9.5476989	9.8391696	9.8335343
19	9 58 15.1	5 7 17.4	12 22.8	4 13 29.0	29 58.1	9.5339933	9.8291237	9.8261307
21	20 31 2.1	5 25 22.6	− 10 17.0	− 3 7 42.8	+ 35 35.8	9.5209607	9.8247268	9.8250477
23	31 39 36.9	5 42 38.2	6 33.9	1 51 14.0	40 23.4	9.5092218	9.8271788	9.8311433
25	43 21 14.4	5 57 52.0	− 1 36.7	− 0 26 24.1	43 38.0	9.4994636	9.8368998	9.8443434
27	55 30 30.9	6 9 42.4	+ 3 48.4	+ 1 2 55.2	44 36.4	9.4923639	9.8533111	9.8635960
29	67 59 17.1	6 16 51.8	8 39.1	2 31 34.1	42 50.5	9.4884833	9.8749637	9.8871673
31	80 37 2.2	6 18 24.6	+ 11 53.7	+ 3 53 48.4	+ 38 16 6	9.4881542	9.8999645	9.9131281
Nov. 2	93 11 56.5	6 14 2.1	12 51.3	5 4 17.5	31 20.4	9.4914058	9.9264524	9.9397604
4	105 32 15.8	6 4 9.8	11 25.6	5 59 7.2	23 2.1	9.4979567	9.9529048	9.9657677
6	117 27 51.3	5 49 51.4	8 4.0	6 36 21.3	14 12.8	9.5072801	9.9782579	9.9903084
8	128 51 11.4	5 32 32.3	+ 3 34.3	6 56 2.2	+ 5 47.9	9.5187111	0.0018721	0.0129212
10	139 37 44.9	5 13 40.1	− 1 12.1	+ 6 59 42.8	− 1 36.8	9.5315570	0.0234405	0.0334255
12	149 45 48.6	4 54 30.1	5 33.2	6 49 47.7	7 44.6	9.5451817	0.0428801	0.0518148
14	159 15 51.4	4 35 58.2	9 1.2	6 28 57.5	12 33.2	9.5590484	0.0602447	0.0681875
16	168 9 53.7	4 18 40.8	11 23.4	5 59 47.1	16 9.1	9.5727355	0.0756624	0.0826901
18	176 30 50.3	4 2 57.6	12 37.8	5 24 31.4	18 43.4	9.5859286	0.0892922	0.0954889
20	184 22 1.1	3 48 56.3	− 12 49.7	+ 4 45 1.6	− 20 28 1	9.5984045	0.1013002	0.1067460
22	191 46 52.2	3 36 36.8	12 8.0	4 2 45.5	21 33.9	9.6100118	0.1118447	0.1166140
24	198 48 44.3	3 25 54.6	10 43.5	3 18 51.1	22 9.8	9.6206524	0.1210701	0.1252285
26	205 30 45.9	3 16 43.3	8 46.6	2 34 9 8	22 23.6	9.6302678	0.1291036	0.1327084
28	211 55 51.5	3 8 55.4	6 27.7	1 49 19.3	22 20.9	9.6388252	0.1360548	0.1391541
30	218 6 40.1	3 2 23.6	− 3 55.1	+ 1 4 48.3	− 22 5.7	9.6463108	0.1420165	0.1446515
Dec. 2	224 5 37.4	2 57 1.4	− 1 16.8	+ 0 20 58.1	21 41.2	9.6527215	0.1470678	0.1492727
4	229 54 56.5	2 52 43.1	+ 1 20.4	− 0 21 55.3	21 9.6	9.6580614	0.1512730	0.1530750
6	235 36 39.7	2 49 23.8	3 51.0	1 3 39.3	20 32.4	9.6623372	0.1546842	0.1561051
8	241 12 41.0	2 46 59.8	6 10.3	1 44 3.9	19 50.4	9.6655569	0.1573424	0.1583999
10	246 44 47.4	2 45 28.0	+ 8 14.0	− 2 23 0.3	− 19 4.2	9.6677276	0.1592803	0.1599860
12	252 14 41.4	2 44 46.6	9 58.4	3 0 19.9	18 13.4	9.6688549	0.1605192	0.1608813
14	257 44 2.2	2 44 54.5	11 20.5	3 35 54.1	17 18.6	9.6689415	0.1610732	0.1610952
16	263 14 27.6	2 45 51.3	12 17.7	4 9 33.5	16 18.6	9.6679877	0.1609473	0.1606290
18	268 47 35.6	2 47 37.6	12 47.9	4 41 7.4	15 12.6	9.6659911	0.1601392	0.1594760
20	274 25 6.4	2 50 14.7	12 49.1	5 10 22.9	13 59.5	9.6629465	0.1586370	0.1576196
22	280 8 48.5	2 53 44.9	+ 12 19.9	− 5 37 4.1	− 12 37.8	9.6588475	0.1564202	0.1550345
24	286 0 15.3	2 58 11.0	11 19.8	6 0 52.4	11 5.7	9.6536857	0.1534580	0.1516852
26	292 1 37.1	3 3 36.8	9 48.8	6 21 24.8	9 20.8	9.6474535	0.1497099	0.1476249
28	298 14 53.0	3 10 7.0	7 47.5	6 38 12.9	7 20.4	9.6401470	0.1451224	0.1424935
30	304 42 16.1	3 17 46.2	5 18.8	6 50 43.1	5 1.5	9.6317676	0.1396290	0.1365179
32	311 26 10.1	3 26 40.2	+ 2 26.9	− 6 58 15.3	− 2 20.7	9.6223266	0.1331487	

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 0	250 47 46.5	1 35 18.3	− 0 30.3	+ 0 17 8.4	− 5 37.2	9.8608402	0.2188170	0.2199502
4	257 8 43.4	1 35 10.8	+ 0 9.6	− 0 5 25.6	5 37.8	9.8611158	0.2210409	0.2220895
8	263 29 13.0	1 35 4.5	0 49.1	0 27 54.0	5 34.4	9.8613691	0.2230961	0.2240608
12	269 49 19.7	1 34 59.4	1 26.1	0 50 0.5	5 27.0	9.8615970	0.2249833	0.2258635
16	276 9 8.0	1 34 55.4	1 58.9	1 11 29.2	5 15.6	9.8617967	0.2267011	0.2274956
20	282 28 42.7	1 34 52.5	+ 2 25.9	− 1 32 4.6	− 5 0.4	9.8619660	0.2282470	0.2289560
24	288 48 8.5	1 34 50.8	2 45.8	1 51 31.8	4 41.6	9.8621029	0.2296232	0.2302490
28	295 7 29.7	1 34 50.2	2 57.7	2 9 37.0	4 19.5	9.8622057	0.2308341	0.2313789
Feb. 1	301 26 50.6	1 34 50.6	3 0.9	2 26 7.3	3 54.2	9.8622731	0.2318837	0.2323490
5	307 46 15.1	1 34 52.0	2 55.3	2 40 50.9	3 26.2	9.8623045	0.2327750	0.2331614
9	314 5 46.7	1 34 54.2	+ 2 41.2	− 2 53 37.0	− 2 55.7	9.8622994	0.2335073	0.2338123
13	320 25 28.6	1 34 57.1	2 19.3	3 4 16.6	2 23.1	9.8622579	0.2340757	0.2342969
17	326 45 23.7	1 35 0.6	1 50.7	3 12 41.9	1 48.7	9.8621804	0.2344752	0.2346103
21	333 5 33.7	1 35 4.7	1 16.6	3 18 46.3	1 13.0	9.8620678	0.2347018	0.2347497
25	339 26 1.3	1 35 9.2	+ 0 38.7	3 22 25.6	− 0 36.3	9.8619216	0.2347540	0.2347151
Mar. 1	345 46 47.8	1 35 14.1	− 0 1.1	− 3 23 36.5	+ 0 1.0	9.8617434	0.2346329	0.2345074
5	352 7 54.6	1 35 19.3	0 40.7	3 22 17.9	0 38.2	9.8615354	0.2343386	0.2341261
9	358 29 22.8	1 35 24.8	1 18.5	3 18 30.4	1 15.2	9 8612999	0.2338691	0.2335665
13	4 51 13.4	1 35 30.5	1 52.5	3 12 16.3	1 51.4	9.8610399	0.2332174	0.2328207
17	11 13 27.0	1 35 36.4	2 20.9	3 3 39.6	2 26.3	9.8607585	0.2323753	0.2318802
21	17 36 4.5	1 35 42.4	− 2 42.5	− 2 52 46.0	+ 2 59.5	9.8604590	0.2313344	0.2307372
25	23 59 6.4	1 35 48.6	2 56.1	2 39 43.3	3 30.7	9.8601451	0.2300882	0.2293873
29	30 22 33.3	1 35 55.0	3 0.9	2 24 40.5	3 59.4	9.8598207	0.2286342	0.2278286
April 2	36 46 26.0	1 36 1.5	2 56.7	2 7 48.5	4 25.2	9.8594900	0.2269701	0.2260584
6	43 10 45.3	1 36 8.2	2 43.9	1 49 19.3	4 47.8	9.8591569	0.2250930	0.2240729
10	49 35 31.9	1 36 15.1	− 2 22.8	− 1 29 26.1	+ 5 6.9	9.8588254	0.2229968	0.2218631
14	56 0 46.2	1 36 22.1	1 54.5	1 8 24.2	5 22.2	9.8585000	0.2206705	0.2194178
18	62 26 28.9	1 36 29.3	1 20.4	0 46 29.0	5 33.5	9.8581848	0.2181041	0.2167281
22	68 52 40.4	1 36 36.4	0 42.2	0 23 56.4	5 40.6	9.8578837	0.2152885	0.2137849
26	75 19 21.1	1 36 43.8	− 0 1.9	− 0 1 4.2	5 43.4	9.8576006	0.2122170	0.2105847
30	81 46 30.8	1 36 51.8	+ 0 38.6	+ 0 21 50.6	+ 5 41.9	9.8573391	0.2088877	0.2071254
May 4	88 14 9.1	1 36 58.0	1 17.2	0 44 30.5	5 36.0	9.8571025	0.2052973	0.2031028
8	94 42 15.3	1 37 4.8	1 51.9	1 6 37.8	5 25.7	9.8568940	0.2014410	0.1994108
12	101 10 47.9	1 37 11.2	2 20.9	1 27 55.2	5 11.1	9.8567165	0.1973104	0.1951388
16	107 39 44.9	1 37 17.0	2 42.8	1 48 6.2	4 52.5	9.8565721	0.1928946	0.1905765
20	114 9 3.9	1 37 22.1	+ 2 56.4	+ 2 6 55.1	+ 4 30.1	9.8564626	0.1881834	0.1857142
24	120 38 41.8	1 37 26.4	3 0.9	2 24 6.8	4 4.1	9.8563896	0.1831685	0.1805461
28	127 8 34.7	1 37 29 6	2 56.2	2 39 27.8	3 34.9	9.8563540	0.1778469	0.1750707
June 1	133 38 38.4	1 37 31.7	2 42.5	2 52 46.0	3 2.9	9 8563563	0.1722171	0.1692857
5	140 8 48.1	1 37 32.6	2 20.5	3 3 51.0	2 28.5	9.8563965	0.1662763	0.1631878
9	146 38 58.7	1 37 32.1	1 51.2	3 12 34.2	1 52.2	9.8564739	0.1600190	0.1567686
13	153 9 4.9	1 37 30.2	+ 1 16.2	+ 3 18 49.0	+ 1 14.5	9.8565877	0.1534351	0.1500173
17	159 39 0.5	1 37 26.9	+ 0 37.4	3 22 30.4	+ 0 35.9	9.8567363	0.1465139	0.1429237
21	166 8 40.2	1 37 22.3	− 0 3.3	3 23 36.2	− 0 3.1	9.8569177	0.1392459	0.1354799
25	172 37 58.8	1 37 16.4	0 43.8	3 22 5.5	0 42.0	9.8571295	0.1316252	0.1276818
29	179 6 51.0	1 37 9.2	1 22.0	3 18 0.4	1 20.2	9.8573689	0.1236493	0.1195276
July 3	185 35 11.6	1 37 0.8	− 1 56 0	+ 3 11 24.3	− 1 57.2	9.8576328	0.1153165	

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GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 3	185 35 11.6	1 37 0.8	− 1 56.0	+ 3 11 24.3	− 1 57.2	9.8576328	0.1153165	0.1110153
7	192 2 57.0	1 36 51.5	2 24.1	3 2 22.9	2 32.6	9.8579178	0.1066227	0.1021373
11	198 30 3.7	1 36 41.5	2 44.9	2 51 3.7	3 5.9	9.8582202	0.0975576	0.0928817
15	204 56 29.0	1 36 30.9	2 57.4	2 37 36.0	3 36.7	9.8585362	0.0881079	0.0832342
19	211 22 11.1	1 36 20.0	3 0.9	2 22 10.7	4 4.6	9.8588618	0.0782589	0.0731807
23	217 47 9.1	1 36 9.0	− 2 55.4	+ 2 4 59.9	− 4 29.2	9.8591929	0.0679988	0.0627122
27	224 11 23.2	1 35 58.1	2 41.1	1 46 17.0	4 50.4	9.8595252	0.0573202	0.0518220
31	230 34 54.2	1 35 47.6	2 18.9	1 26 16.6	5 8.0	9.8598546	0.0462166	0.0405030
Aug. 4	236 57 43.8	1 35 37.6	1 49.8	1 5 13.8	5 21.6	9.8601771	0.0346799	0.0287452
8	243 19 54.5	1 35 28.2	1 15.4	0 43 24.3	5 31.2	9.8604887	0.0226962	0.0165303
12	249 41 29.1	1 35 19.6	− 0 37.3	+ 0 21 4.6	− 5 36.6	9.8607856	0.0102445	0.0038356
16	256 2 31.6	1 35 12.1	+ 0 2.6	− 0 1 28.7	5 38.0	9.8610642	9.9973001	9.9906351
20	262 23 6.1	1 35 5.7	0 42.3	0 23 59.3	5 35.3	9.8613212	9.9838378	9.9769056
24	268 43 17.0	1 35 0.4	1 19.9	0 46 10.8	5 28.5	9.8615532	9.9698361	9.9626270
28	275 3 8.7	1 34 56.2	1 53.6	1 7 47.1	5 17.8	9.8617576	9.9552763	9.9477816
Sept. 1	281 22 46.1	1 34 53.1	+ 2 21.8	− 1 28 33.0	− 5 3.3	9.8619322	9.9401399	9.9323479
5	287 42 13.7	1 34 51.2	2 43.0	1 48 13.2	4 45.1	9.8620748	9.9244012	9.9162953
9	294 1 36.2	1 34 50.4	2 56.2	2 6 33.7	4 23.6	9.8621835	9.9080254	9.8995856
13	300 20 57.5	1 34 50.7	3 0.9	2 23 21.5	3 58.9	9.8622570	9.8909700	9.8821728
17	306 40 21.8	1 34 51.9	2 56.9	2 38 24.6	3 31.4	9.8622946	9.8731883	9.8640111
21	312 59 52.6	1 34 53.9	+ 2 44.3	− 2 51 32.0	− 3 1.3	9.8622960	9.8546363	9.8450595
25	319 19 33.1	1 34 56.7	2 23.7	3 2 34.5	2 28.9	9.8622610	9.8352763	9.8252824
29	325 39 26.3	1 35 0.2	1 56.1	3 11 23.5	1 54.8	9.8621900	9.8150737	9.8046457
Oct. 3	331 59 34.4	1 35 4.2	1 22.9	3 17 53.1	1 19.3	9.8620837	9.7939931	9.7831102
7	338 19 59.5	1 35 8.6	0 45.6	3 21 57.9	0 42.7	9.8619436	9.7719908	9.7606290
11	344 40 43.2	1 35 13.4	+ 0 6.0	− 3 23 34.9	− 0 5.5	9.8617712	9.7490189	9.7371550
15	351 1 47.0	1 35 18.6	− 0 33.9	3 22 42.4	+ 0 31.8	9.8615686	9.7250327	9.7126494
19	357 23 12.0	1 35 24.0	1 12.1	3 19 20.7	1 8.8	9.8613383	9.7000051	9.6871021
23	3 44 59.1	1 35 29.6	1 46.9	3 13 32.0	1 45.1	9.8610829	9.6739459	9.6605456
27	10 7 9.1	1 35 35.4	2 16.5	3 5 19.8	2 20.3	9.8606054	9.6469143	9.6330697
31	16 29 42.7	1 35 41.4	− 2 39.3	− 2 54 49.7	+ 2 53.9	9.8605093	9.6190344	9.6048362
Nov. 4	22 52 40.6	1 35 47.6	2 54.3	2 42 8.9	3 25.5	9.8601983	9.5905091	9.5760964
8	29 16 3.4	1 35 53.9	3 0.7	2 27 26.2	3 54.6	9.8598763	9.5616517	9.5472407
12	35 39 52.0	1 36 0.4	2 58.2	2 10 52.2	4 20.9	9.8595471	9.5329439	9.5188594
16	42 4 6.7	1 36 7.1	2 46.8	1 52 39.0	4 44.1	9.8592149	9.5051055	9.4918199
20	48 28 48.4	1 36 13.9	− 2 27.0	− 1 32 59.6	+ 5 3.8	9.8588839	9.4791599	9.4673014
24	54 53 57.9	1 36 20.9	1 59.9	1 12 8.6	5 19 8	9.8585583	9.4564361	9.4467608
28	61 19 35.5	1 36 28.0	1 26.7	0 50 21.4	5 31.8	9.8582423	9.4384698	9.4317464
Dec. 2	67 45 41.8	1 36 35.2	0 49.1	0 27 54.2	5 39.7	9.8579398	9.4267494	9.4236030
6	74 12 17.1	1 36 42.4	− 0 9.0	− 0 5 4.1	5 43.2	9.8576547	9.4223866	9.4231290
10	80 39 21.3	1 36 49.6	+ 0 31.6	+ 0 17 51 6	5 42.4	9.8573907	9.4258087	9.4303543
14	87 6 54.0	1 36 56.6	+ 1 10.7	+ 0 40 35.3	+ 5 37.2	9.8571514	9.4366507	9.4445491
18	93 34 54.5	1 37 3.4	1 46.2	1 2 49.4	5 27.7	9.8569398	9.4538778	9.4644494
22	100 3 21.4	1 37 9.8	2 16.3	1 24 16.7	5 13.9	9.8567586	9.4760719	9.4885582
26	106 32 12.9	1 37 15.7	2 39.6	1 44 40.4	4 56.0	9.8566101	9.5017289	9.5154201
30	113 1 26.7	1 37 20.9	2 54.7	2 3 44.6	4 34.2	9.8564964	9.5294859	9.5437987
34	119 30 59.8	1 37 25.2	+ 3 0.8	+ 2 21 14.1	+ 4 8.9	9.8564188	9.5582487	

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GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 0	97 42 26.8	28 38.10	+ 53.3	+ 1 23 53.5	+ 36.35	0.2022752	9.7873327	9.7905676
4	99 36 40.9	28 29.01	52.8	1 26 15.7	34.75	0.2034432	9.7943658	9.7987022
8	101 30 19.2	28 20.15	51.9	1 28 31.5	33.14	0.2045807	9.8035489	9.8088757
12	103 23 22.6	28 11.56	50.8	1 30 40.8	31.52	0.2056868	9.8146513	9.8208419
16	105 15 52.1	28 3.27	49.6	1 32 43.6	29.89	0.2067606	9.8274122	9.8343263
20	107 7 49.1	27 55.30	+ 48.1	+ 1 34 39.9	+ 28.26	0.2078014	9.8415481	9.8490406
24	108 59 14.9	27 47.61	46.4	1 36 29.7	26.63	0.2088084	9.8567675	9.8646945
28	110 50 10.4	27 40.19	44.5	1 38 13.0	25.00	0.2097809	9.8727892	9.8810214
Feb. 1	112 40 36.8	27 33.08	42.5	1 39 49.7	23.36	0.2107185	9.8893635	9.8977911
5	114 30 35.4	27 26.27	40.3	1 41 19.9	21.72	0.2116204	9.9062822	9.9148168
9	116 20 7.4	27 19.75	+ 37.9	+ 1 42 43.5	+ 20.09	0.2124862	9.9233771	9.9319469
13	118 9 13.9	27 13.53	35.3	1 44 0.6	18.46	0.2133150	9.9405114	9.9490569
17	119 57 56.0	27 7.61	32.7	1 45 11.1	16.83	0.2141066	9.9575701	9.9660383
21	121 46 15.1	27 2.00	30.0	1 46 15.2	15.21	0.2148605	9.9744507	9.9827977
25	123 34 12.4	26 56.70	27.0	1 47 12.9	13.58	0.2155763	9.9910710	9.9992628
Mar. 1	125 21 49.1	26 51.69	+ 24.0	+ 1 48 4.0	+ 11.94	0.2162535	0.0073671	0.0153797
5	127 9 6.3	26 46.97	21.0	1 48 48.4	10.31	0.2168918	0.0232978	0.0311192
9	128 56 5.2	26 42.56	17.9	1 49 26.4	8.70	0.2174910	0.0388416	0.0464632
13	130 42 47.1	26 38.47	14.7	1 49 58.0	7.11	0.2180506	0.0539830	0.0613997
17	132 29 13.3	26 34.67	11.5	1 50 23.3	5.52	0.2185704	0.0687114	0.0759164
21	134 15 24.8	26 31.15	+ 8.2	+ 1 50 42.2	+ 3.93	0.2190501	0.0830134	0.0900012
25	136 1 22.8	26 27.94	4.9	1 50 54.8	2.34	0.2194894	0.0968787	0.1036458
29	137 47 8.7	26 25.02	+ 1.6	1 51 0.9	+ 0.76	0.2198882	0.1103030	0.1168510
April 2	139 32 43.4	26 22.40	− 1.7	1 51 0.8	− 0.80	0.2202462	0.1232910	0.1296246
6	141 18 8.3	26 20.10	5.0	1 50 54.5	2.36	0.2205634	0.1358533	0.1419785
10	143 3 24.6	26 18.09	− 8.3	+ 1 50 41.9	− 3.92	0.2208396	0.1480020	0.1539249
14	144 48 33.4	26 16.37	11.5	1 50 23.1	5.47	0.2210745	0.1597478	0.1654711
18	146 33 36.0	26 14.96	14.7	1 49 58.2	7.00	0.2212680	0.1710953	0.1766209
22	148 18 33.5	26 13.85	17.8	1 49 27.1	8.52	0.2214203	0.1820486	0.1873792
26	150 3 27.2	26 13.03	20.9	1 48 50.0	10.04	0.2215312	0.1926135	0.1977530
30	151 48 18.2	26 12.50	− 23.9	+ 1 48 6.8	− 11.55	0.2216005	0.2027994	0.2077546
May 4	153 33 7.6	26 12.26	26.8	1 47 17.6	13.05	0.2216284	0.2126206	0.2173993
8	155 17 56.7	26 12.31	29.7	1 46 22.4	14.55	0.2216148	0.2220924	0.2267011
12	157 2 46.6	26 12.67	32.3	1 45 21.2	16.03	0.2215596	0.2312262	0.2356684
16	158 47 38.5	26 13.35	34.8	1 44 14.1	17.50	0.2214627	0.2400286	0.2443074
20	160 32 33.8	26 14.35	− 37.3	+ 1 43 1.2	− 18.95	0.2213245	0.2485053	0.2526226
24	162 17 33.7	26 15.63	39.6	1 41 42.5	20.40	0.2211450	0.2566604	0.2606200
28	164 2 39.2	26 17.19	41.8	1 40 18.0	21.84	0.2209241	0.2645029	0.2683106
June 1	165 47 51.5	26 19.04	43.8	1 38 47.8	23.26	0.2206620	0.2720446	0.2757064
5	167 33 11.9	26 21.20	45.7	1 37 12.0	24.67	0.2203589	0.2792976	0.2828194
9	169 18 41.5	26 23.66	47.3	1 35 30.4	26.07	0.2200148	0.2862726	0.2896577
13	171 4 21.6	26 26.42	− 48.8	+ 1 33 43.4	− 27.46	0.2196298	0.2929754	0.2962259
17	172 50 13.3	26 29.49	50.1	1 31 50.8	28.84	0.2192043	0.2994097	0.3025271
21	174 36 17.9	26 32.86	51.1	1 29 52.7	30.20	0.2187385	0.3055787	0.3085653
25	176 22 36.6	26 36.54	52.1	1 27 49.2	31.55	0.2182326	0.3114880	0.3143482
29	178 9 10.6	26 40.50	53.0	1 25 40.3	32.88	0.2176867	0.3171471	0.3198860
July 3	179 56 1.0	26 44.76	− 53.5	+ 1 23 26.2	− 34.19	0.2171011	0.3225659	

MARS.

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	° ′ ″	′ ″	″	° ′ ″	″			
July 3	179 56 1.0	26 44.76	− 53.5	+ 1 23 26.2	− 34.19	0.2171011	0.3225659	0.3251877
7	181 43 9.1	26 49.32	53.8	1 21 6.8	35.49	0.2164762	0.3277523	0.3302605
11	183 30 36.0	26 54.19	53.9	1 18 42.3	36.76	0.2158126	0.3327125	0.3351081
15	185 18 23.0	26 59.38	53.8	1 16 12.7	38.02	0.2151100	0.3374475	0.3397310
19	187 6 31.4	27 4.88	53.5	1 13 38.1	39.27	0.2143693	0.3419592	0.3441326
23	188 55 2.4	27 10.66	− 53.0	+ 1 10 58.5	− 40.50	0.2135907	0.3462518	0.3483178
27	190 43 57.1	27 16.73	52.3	1 8 14.1	41.70	0.2127748	0.3503319	0.3522949
31	192 33 16.6	27 23.11	51.2	1 5 24.9	42.88	0.2119219	0.3542076	0.3560710
Aug. 4	194 23 2.4	27 29.81	50.0	1 2 31.1	44.03	0.2110327	0.3578860	0.3596529
8	196 13 15.6	27 36.82	48.7	0 59 32.7	45.16	0.2101077	0.3613715	0.3630423
12	198 3 57.4	27 44.12	− 47.2	+ 0 56 29.8	− 46.27	0.2091475	0.3646653	0.3662405
16	199 55 9.0	27 51.71	45.4	0 53 22.5	47.35	0.2081526	0.3677681	0.3692485
20	201 46 51.5	27 59.58	43.5	0 50 11.0	48.39	0.2071237	0.3706822	0.3720699
24	203 39 6.0	28 7.76	41.3	0 46 55.4	49.40	0.2060615	0.3734124	0.3747104
28	205 31 53.9	28 16.26	38.9	0 43 35.8	50.39	0.2049668	0.3759650	0.3771772
Sept. 1	207 25 16.5	28 25.07	− 36.4	+ 0 40 12.3	− 51.34	0.2038404	0.3783475	0.3794761
5	209 19 14.9	28 34.14	33.7	0 36 45.1	52.24	0.2026832	0.3805634	0.3816095
9	211 13 50.0	28 43.48	30.9	0 33 14.4	53.11	0.2014961	0.3826141	0.3835772
13	213 9 3.1	28 53.12	27.8	0 29 40.2	53.95	0.2002799	0.3844991	0.3853798
17	215 4 55.4	29 3.05	24.6	0 26 2.8	54.74	0.1990356	0.3862197	0.3870194
21	217 1 27.9	29 13.26	− 21.3	+ 0 22 22.3	− 55.48	0.1977643	0.3877797	0.3885015
25	218 58 41.8	29 23.75	17.8	0 18 39.0	56.16	0.1964673	0.3891854	0.3898322
29	220 56 38.3	29 34.51	14.3	0 14 53.0	56.80	0.1951458	0.3904425	0.3910172
Oct. 3	222 55 18.3	29 45.51	10.7	0 11 4.6	57.37	0.1938007	0.3915561	0.3920593
7	224 54 42.7	29 56.78	7.0	0 7 14.0	57.90	0.1924333	0.3925265	0.3929579
11	226 54 52.8	30 8.32	− 3.3	+ 0 3 21.4	− 58.38	0.1910451	0.3933537	0.3937142
15	228 56 49.6	30 20.07	+ 0.5	− 0 0 33.1	58.79	0.1896375	0.3940393	0.3943295
19	230 57 33.7	30 32.02	4.4	0 4 29.0	59.12	0.1882121	0.3945857	0.3948084
23	233 0 6.1	30 44.22	8.2	0 8 26.1	59.40	0.1867704	0.3949986	0.3951571
27	235 3 27.8	30 56.66	12.0	0 12 24.2	59.60	0.1853139	0.3952844	0.3953811
31	237 7 39.7	31 9.32	+ 15.7	− 0 16 22.9	− 59.71	0.1838443	0.3954475	0.3954840
Nov. 4	239 12 42.6	31 22.15	19.4	0 20 21.9	59.76	0.1823635	0.3954906	0.3954673
8	241 18 37.1	31 35.12	23.0	0 24 21.0	59.72	0.1808734	0.3954141	0.3953309
12	243 25 23.8	31 48.25	26.5	0 28 19.8	59.59	0.1793756	0.3952179	0.3950758
16	245 33 3.3	32 1.54	30.0	0 32 17.7	59.36	0.1778722	0.3949051	0.3947066
20	247 41 36.2	32 14.99	+ 33.3	− 0 36 14.6	− 59.06	0.1763654	0.3944814	0.3942301
24	249 51 3.2	32 28.54	36.4	0 40 10.2	58.67	0.1748573	0.3939534	0.3936520
28	252 1 24.6	32 42.16	39.3	0 44 4.0	58.16	0.1733500	0.3933266	0.3929772
Dec. 2	254 12 40.6	32 55.84	42.0	0 47 55.5	57.54	0.1718457	0.3926040	0.3922072
6	256 24 51.4	33 9.57	44.4	0 51 44.3	56.82	0.1703469	0.3917871	0.3913434
10	258 37 57.2	33 23.34	46.7	0 55 30.1	56.02	0.1688558	0.3908761	0.3903860
14	260 51 58.1	33 37.11	+ 48.6	− 0 59 12.5	− 55.11	0.1673749	0.3898737	0.3893400
18	263 6 54.1	33 50.86	50.3	1 2 51.0	54.06	0.1659068	0.3887857	0.3882117
22	265 22 45.0	34 4.57	51.7	1 6 25.0	52.90	0.1644540	0.3876188	0.3870079
26	267 39 30.6	34 18.20	52.8	1 9 54.2	51.62	0.1630190	0.3863794	0.3857338
30	269 57 10.5	34 31.72	53.5	1 13 18.0	50.24	0.1616045	0.3850715	0.3843927
34	272 15 44.3	34 45.14	+ 53.9	− 1 16 36.1	− 48.75	0.1602134	0.3836972	

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GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 0	55 28 6.2	5 22.45	− 27.1	− 0 54 21.9	+ 5.32	0.6997736	0.6398452	0.6424768
4	55 49 35.8	5 22.32	27.1	0 54 0.6	5.35	0.6998605	0.6451556	0.6478775
8	56 11 4.8	5 22.19	27.1	0 53 39.1	5.38	0.6999480	0.6506375	0.6534314
12	56 32 33.3	5 22.06	27.0	0 53 17.5	5.41	0.7000361	0.6562548	0.6591033
16	56 54 1.3	5 21.92	27.0	0 52 55.8	5.44	0.7001246	0.6619728	0.6648593
20	57 15 28.7	5 21.79	− 27.0	− 0 52 34.0	+ 5.47	0.7002138	0.6677581	0.6706656
24	57 36 55.6	5 21.66	27.0	0 52 12.0	5.50	0.7003036	0.6735771	0.6764893
28	57 58 22.0	5 21.53	26.9	0 51 49.9	5.53	0.7003939	0.6793984	0.6823013
Feb. 1	58 19 47.9	5 21.40	26.9	0 51 27.7	5.56	0.7004848	0.6851946	0.6880758
5	58 41 13.2	5 21.26	26.8	0 51 5.4	5.59	0.7005762	0.6909419	0.6937907
9	59 2 38.0	5 21.12	− 26.8	− 0 50 43.0	+ 5.62	0.7006681	0.6966196	0.6994263
13	59 24 2.2	5 20.98	26.7	0 50 20.5	5.64	0.7007605	0.7022082	0.7049631
17	59 45 25.8	5 20.84	26.6	0 49 57.9	5.67	0.7008534	0.7076887	0.7103829
21	60 6 48.9	5 20.70	26.6	0 49 35.2	5.70	0.7009468	0.7130433	0.7156682
25	60 28 11.4	5 20.56	26.5	0 49 12.4	5.72	0.7010408	0.7182553	0.7208034
Mar. 1	60 49 33.4	5 20.42	− 26.4	− 0 48 49.5	+ 5.75	0.7011353	0.7233108	0.7257767
5	61 10 54.8	5 20.28	26.3	0 48 26.5	5.77	0.7012302	0.7282001	0.7305800
9	61 32 15.6	5 20.14	26.3	0 48 3.4	5.80	0.7013257	0.7329153	0.7352048
13	61 53 35.9	5 20.00	26.2	0 47 40.2	5.82	0.7014215	0.7374476	0.7396426
17	62 14 55.6	5 19.86	26.1	0 47 16.9	5.85	0.7015178	0.7417887	0.7438851
21	62 36 14.8	5 19.72	− 26.0	− 0 46 53.4	+ 5.87	0.7016146	0.7459308	0.7479251
25	62 57 33.4	5 19.57	25.9	0 46 29.9	5.89	0.7017119	0.7498670	0.7517561
29	63 18 51.4	5 19.42	25.8	0 46 6.3	5.92	0.7018099	0.7535921	0.7553745
April 2	63 40 8 8	5 19.27	25.7	0 45 42.6	5.94	0.7019083	0.7571033	0.7587782
6	64 1 25.6	5 19.12	25.6	0 45 18.8	5.96	0.7020072	0.7603989	0.7619649
10	64 22 41.8	5 18.97	− 25.5	− 0 44 54.9	+ 5.98	0.7021067	0.7634761	0.7649321
14	64 43 57.4	5 18.82	25.4	0 44 30.9	6.00	0.7022066	0.7663325	0.7676770
18	65 5 12.4	5 18.67	25.3	0 44 6.8	6.03	0.7023071	0.7689648	0.7701958
22	65 26 26.9	5 18.52	25.1	0 43 42.6	6.05	0.7024081	0.7713700	0.7724871
26	65 47 40.7	5 18.37	25.0	0 43 18.3	6.07	0.7025097	0.7735470	0.7745498
30	66 8 53.9	5 18.22	− 24.9	− 0 42 53.9	+ 6.09	0.7026118	0.7754961	0.7763858
May 4	66 30 6.5	5 18.07	24.8	0 42 29.5	6.11	0.7027143	0.7772184	0.7779939
8	66 51 18.6	5 17.92	24.6	0 42 5.0	6.13	0.7028172	0.7787129	0.7793752
12	67 12 30.0	5 17.77	24.5	0 41 40.4	6.15	0.7029205	0.7799803	0.7805282
16	67 33 40.8	5 17.62	24.3	0 41 15.7	6.17	0.7030243	0.7810184	0.7814509
20	67 54 51.0	5 17.46	− 24.1	− 0 40 50.9	+ 6.19	0.7031284	0.7818259	0.7821436
24	68 16 0.5	5 17.31	23.9	0 40 26.1	6.21	0.7032329	0.7824038	0.7826067
28	68 37 9.4	5 17.15	23.8	0 40 1.2	6.23	0.7033378	0.7827530	0.7828426
June 1	68 58 17.7	5 17.00	23.6	0 39 36.2	6.25	0.7034431	0.7828758	0.7828524
5	69 19 25.4	5 16.84	23.5	0 39 11.1	6.27	0.7035489	0.7827728	0.7826369
9	69 40 32.5	5 16.69	23.3	0 38 45.9	6.29	0.7036550	0.7824442	0.7821949
13	70 1 39.0	5 16.53	− 23.2	− 0 38 20.7	+ 6.31	0.7037615	0.7818889	0.7815264
17	70 22 44.8	5 16.38	23.0	0 37 55.4	6.33	0.7038685	0.7811072	0.7806316
21	70 43 50.0	5 16.22	22.8	0 37 30.0	6.35	0.7039758	0.7800996	0.7795116
25	71 4 54.5	5 16.06	22.6	0 37 4.5	6.37	0.7040835	0.7788681	0.7781694
29	71 25 58.4	5 15.90	22.4	0 36 39.0	6.39	0.7041917	0.7774157	0.7766071
July 3	71 47 1.7	5 15.75	− 22.2	− 0 36 13.4	+ 6.40	0.7043003	0.7757438	

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 3	71 47 1.7	5 15.75	− 22.2	− 0 36 13.4	+ 6.40	0.7043003	0.7757438	0.7748259
7	72 8 4.4	5 15.59	22.0	0 35 47.7	6.42	0.7044092	0.7738533	0.7728260
11	72 29 6.5	5 15.43	21.8	0 35 22.0	6.44	0.7045185	0.7717441	0.7706079
15	72 50 7.9	5 15.27	21.6	0 34 56.2	6.46	0.7046283	0.7694172	0.7681725
19	73 11 8.7	5 15.11	21.4	0 34 30.3	6.48	0.7047385	0.7668743	0.7655230
23	73 32 8.8	5 14.95	− 21.2	− 0 34 4.4	+ 6.49	0.7048490	0.7641193	0.7626635
27	73 53 8.2	5 14.79	21.0	0 33 38.4	6.51	0.7049600	0.7611562	0.7595978
31	74 14 7.0	5 14.63	20.8	0 33 12.4	6.52	0.7050712	0.7579887	0.7563293
Aug. 4	74 35 5.2	5 14.47	20.6	0 32 46.3	6.54	0.7051828	0.7546196	0.7528601
8	74 56 2.7	5 14.30	20.4	0 32 20.1	6.55	0.7052947	0.7510510	0.7491931
12	75 16 59.5	5 14.14	− 20.1	− 0 31 53.8	+ 6.57	0.7054070	0.7472868	0.7453331
16	75 37 55.7	5 13.97	19.9	0 31 27.5	6.58	0.7055196	0.7433325	0.7412862
20	75 58 51.2	5 13.80	19.7	0 31 1.1	6.60	0.7056325	0.7391952	0.7370606
24	76 19 46.1	5 13.64	19.5	0 30 34.7	6.61	0.7057458	0.7348836	0.7326652
28	76 40 40.3	5 13.47	19.2	0 30 8.3	6.63	0.7058595	0.7304060	0.7281073
Sept. 1	77 1 33.8	5 13.30	− 19.0	− 0 29 41.8	+ 6.64	0.7059733	0.7257702	0.7233960
5	77 22 26.7	5 13.14	18.8	0 29 15.2	6.65	0.7060874	0.7209853	0.7185398
9	77 43 18.9	5 12.97	18.6	0 28 48.6	6.67	0.7062018	0.7160610	0.7135508
13	78 4 10.5	5 12.81	18.3	0 28 22.0	6.68	0 7063166	0.7110108	0.7084433
17	78 25 1.4	5 12.64	18.1	0 27 55.3	6.69	0.7064315	0.7058505	0.7032347
21	78 45 51.6	5 12.48	− 17.8	− 0 27 28.5	+ 6.70	0.7065467	0.7005980	0.6979428
25	79 6 41.2	5 12.31	17.6	0 27 1.7	6.71	0.7066620	0.6952714	0.6925864
29	79 27 30.1	5 12.14	17.3	0 26 34.9	6.72	0.7067775	0.6898897	0.6871842
Oct. 3	79 48 18.3	5 11.97	17.1	0 26 8.0	6.73	0.7068934	0.6844728	0.6817585
7	80 9 5.9	5 11.80	16.8	0 25 41.1	6.74	0.7070097	0.6790443	0.6763338
11	80 29 52.8	5 11.63	− 16.5	− 0 25 14.1	+ 6.75	0.7071262	0.6736306	0.6709384
15	80 50 39.0	5 11.46	16.2	0 24 47.1	6.76	0.7072431	0.6682618	0.6656039
19	81 11 24.5	5 11.29	16 0	0 24 20.1	6.77	0.7073602	0.6629695	0.6603625
23	81 32 9.3	5 11.12	15.7	0 23 53.0	6.78	0.7074776	0.6577872	0.6552475
27	81 52 53.5	5 10.95	15.5	0 23 25.9	6.79	0.7075953	0.6527476	0.6502916
31	82 13 37.0	5 10.78	− 15.2	− 0 22 58.7	+ 6.80	0.7077132	0.6478844	0.6455301
Nov. 4	82 34 19.8	5 10.61	15.0	0 22 31.5	6.81	0.7078314	0.6432338	0.6410005
8	82 55 1.9	5 10.44	14.7	0 22 4.3	6.82	0.7079497	0.6388350	0.6367425
12	83 15 43.3	5 10.27	14.4	0 21 37.0	6.83	0.7080683	0.6347279	0.6327964
16	83 36 24.1	5 10.10	14.1	0 21 9.7	6.84	0.7081872	0.6309524	0.6292004
20	83 57 4.2	5 9.93	− 13.8	− 0 20 42.4	+ 6.84	0.7083061	0.6275450	0.6299899
24	84 17 43.6	5 9.76	13.5	0 20 15.0	6.85	0.7084252	0.6245391	0.6231964
28	84 38 22.3	5 9.59	13.2	0 19 47.6	6.86	0.7085445	0.6219648	0.6208483
Dec. 2	84 59 0.4	5 9.42	12.9	0 19 20.2	6.87	0.7086639	0.6198505	0.6189747
6	85 19 37.8	5 9.25	12.7	0 18 52.7	6.87	0.7087837	0.6182235	0.6175997
10	85 40 14.5	5 9.08	12.4	0 18 25.2	6.88	0.7089037	0.6171054	0.6167425
14	86 0 50 5	5 8.91	− 12.1	− 0 17 57.7	+ 6.88	0.7090239	0.6165123	0.6164155
18	86 21 25.8	5 8.74	11.8	0 17 30.2	6.89	0.7091444	0.6164522	0.6166219
22	86 42 0.4	5 8.57	11.5	0 17 2.7	6.89	0.7092651	0.6169248	0.6173595
26	87 2 34.3	5 8.40	11.2	0 16 35.2	6.90	0.7093858	0.6179249	0.6186193
30	87 23 7.5	5 8.23	10.9	0 16 7.6	6.90	0.7095067	0.6194424	0.6203906
34	87 43 40.1	5 8.06	− 10.6	− 0 15 40.0	+ 6.90	0.7096278	0.6214630	

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan. 0	41 7 9.8	2 9.66	− 0 58.6	− 2 21 25.8	+ 1.78	0.9640177	0.9414200	0.9429180
4	41 15 48.5	2 9.69	0 59.0	2 21 18.7	1.79	0.9639727	0.9444338	0.9459657
8	41 24 27.3	2 9.72	0 59.4	2 21 11.5	1.81	0.9639278	0.9475114	0.9490690
12	41 33 6.2	2 9.75	0 59.7	2 21 4.2	1.82	0.9638830	0.9506363	0.9522114
16	41 41 45.2	2 9.77	1 0.1	2 20 56.9	1.84	0.9638383	0.9537921	0.9553762
20	41 50 24.4	2 9.80	− 1 0.5	− 2 20 49.5	+ 1.85	0.9637936	0.9569618	0.9585467
24	41 59 3.7	2 9.83	1 0.9	2 20 42.1	1.86	0.9637490	0.9601289	0.9617064
28	42 7 43.1	2 9.86	1 1.3	2 20 34.6	1.87	0.9637045	0.9632773	0.9648398
Feb. 1	42 16 22.6	2 9.88	1 1.7	2 20 27.1	1.89	0.9636601	0.9663926	0.9679337
5	42 25 2.2	2 9.91	1 2.0	2 20 19.5	1.90	0.9636158	0.9694619	0.9709757
9	42 33 41.9	2 9.93	− 1 2.4	− 2 20 11.9	+ 1.91	0.9635715	0.9724737	0.9739544
13	42 42 21.6	2 9.96	1 2.8	2 20 4.2	1.93	0.9635273	0.9754162	0.9768581
17	42 51 1.5	2 9.98	1 3.2	2 19 56.5	1.94	0.9634832	0.9782786	0.9796760
21	42 59 41.5	2 10.01	1 3.5	2 19 48.7	1.96	0.9634391	0.9810491	0.9823967
25	43 8 21.6	2 10.03	1 3.9	2 19 40.8	1.97	0.9633951	0.9837180	0.9850117
Mar. 1	43 17 1.8	2 10.06	− 1 4.3	− 2 19 32.9	+ 1.98	0.9633512	0.9862768	0.9875125
5	43 25 42.0	2 10.08	1 4.6	2 19 24.9	2.00	0.9633074	0.9887182	0.9898930
9	43 34 22.4	2 10.11	1 5.0	2 19 16.9	2.01	0.9632637	0.9910362	0.9921470
13	43 43 2.9	2 10.13	1 5.4	2 19 8.8	2.03	0.9632201	0.9932246	0.9942682
17	43 51 43.5	2 10.16	1 5.7	2 19 0.7	2.04	0.9631765	0.9952771	0.9962505
21	44 0 24.1	2 10.18	− 1 6.1	− 2 18 52.5	+ 2.05	0.9631330	0.9971877	0.9980882
25	44 9 4.9	2 10.21	1 6.4	2 18 44.2	2.07	0.9630896	0.9989515	0.9997768
29	44 17 45.8	2 10.23	1 6.8	2 18 35.9	2.08	0.9630463	1.0005641	1.0013131
April 2	44 26 26.8	2 10.26	1 7.1	2 18 27.6	2.10	0.9630031	1.0020232	1.0026944
6	44 35 7.9	2 10.28	1 7.5	2 18 19.1	2.11	0.9629600	1.0033268	1.0039194
10	44 43 49.1	2 10.31	− 1 7.8	− 2 18 10.7	+ 2.12	0.9629169	1.0044723	1.0049850
14	44 52 30.4	2 10.33	1 8.2	2 18 2.1	2.14	0.9628739	1.0054573	1.0058888
18	45 1 11.8	2 10.36	1 8.5	2 17 53.6	2.15	0.9628310	1.0062793	1.0066283
22	45 9 53.3	2 10.38	1 8.9	2 17 44.9	2.17	0.9627882	1.0069360	1.0072023
26	45 18 34.9	2 10.41	1 9.2	2 17 36.3	2.18	0.9627455	1.0074271	1.0076106
30	45 27 16.6	2 10.43	− 1 9.6	− 2 17 27.5	+ 2.19	0.9627029	1.0077529	1.0078539
May 4	45 35 58.3	2 10.46	1 9.9	2 17 18.8	2.20	0.9626604	1.0079137	1.0079325
8	45 44 40.2	2 10.48	1 10.3	2 17 9.9	2.22	0.9626180	1.0079101	1.0078463
12	45 53 22.2	2 10.51	1 10.6	2 17 1.0	2.23	0.9625756	1.0077412	1.0075948
16	46 2 4.3	2 10.53	1 11.0	2 16 52.1	2.25	0.9625333	1.0074073	1.0071786
20	46 10 46.5	2 10.56	− 1 11.3	− 2 16 43.0	+ 2.26	0.9624911	1.0069089	1.0065984
24	46 19 28.8	2 10.58	1 11.6	2 16 34.0	2.27	0.9624490	1.0062475	1.0058563
28	46 28 11.2	2 10.61	1 12.0	2 16 24.9	2.29	0.9624070	1.0054253	1.0049550
June 1	46 36 53.7	2 10.63	1 12.3	2 16 15.7	2.30	0.9623651	1.0044453	1.0038969
5	46 45 36.3	2 10.66	1 12.6	2 16 6.5	2.31	0.9623233	1.0033096	1.0026838
9	46 54 19.0	2 10.68	1 12.9	2 15 57.2	2.32	0.9622817	1.0020198	1.0013179
13	47 3 1.7	2 10.71	− 1 13.3	− 2 15 47.9	+ 2.33	0.9622402	1.0005784	0.9998013
17	47 11 44.6	2 10.73	1 13.6	2 15 38.5	2.35	0.9621987	0.9989875	0.9981372
21	47 20 27.6	2 10.76	1 13.9	2 15 29.1	2.36	0.9621573	0.9972513	0.9963302
25	47 29 10.7	2 10.78	1 14.2	2 15 19.6	2.38	0.9621160	0.9953745	0.9943851
29	47 37 53.9	2 10.81	1 14.5	2 15 10.1	2.39	0.9620749	0.9933623	0.9923069
July 3	47 46 37.1	2 10.83	− 1 14.9	− 2 15 0.5	+ 2.40	0.9620339	0.9912195	

SATURN.

GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
July 3	47 46 37.1	2 10.83	− 1 14.9	− 2 15 0.5	+ 2.40	0.9620339	0.9912195	0.9901003
7	47 55 20.4	2 10.85	1 15.2	2 14 50.9	2.42	0.9619929	0.9889502	0.9877696
11	48 4 3.9	2 10.88	1 15.5	2 14 41.2	2.43	0.9619520	0.9865593	0.9853202
15	48 12 47.5	2 10.90	1 15.8	2 14 31.4	2.45	0.9619112	0.9840531	0.9827588
19	48 21 31.2	2 10.93	1 16.1	2 14 21.6	2.46	0.9618706	0.9814383	0.9800928
23	48 30 14.9	2 10.95	− 1 16.4	− 2 14 11.7	+ 2.47	0.9618301	0.9787233	0.9773310
27	48 38 58.7	2 10.97	1 16.7	2 14 1.8	2.49	0.9617896	0.9759168	0.9744818
31	48 47 42.6	2 10.99	1 17.0	2 13 51.8	2.50	0.9617492	0.9730271	0.9715536
Aug. 4	48 56 26.6	2 11.02	1 17.3	2 13 41.8	2.52	0.9617089	0.9700625	0.9685550
8	49 5 10.7	2 11.04	1 17.6	2 13 31.7	2.53	0.9616687	0.9670326	0.9654963
12	49 13 55.0	2 11.06	− 1 17.9	− 2 13 21.5	+ 2.54	0.9616286	0.9639474	0.9623877
16	49 22 39.3	2 11.08	1 18.2	2 13 11.3	2.56	0.9615886	0.9608187	0.9592421
20	49 31 23.7	2 11.11	1 18.5	2 13 1.1	2.57	0.9615487	0.9576597	0.9560732
24	49 40 8.2	2 11.13	1 18.8	2 12 50.8	2.58	0.9615089	0.9544841	0 9528941
28	49 48 52.7	2 11.16	1 19.1	2 12 40.4	2.59	0.9614693	0.9513048	0.9497180
Sept. 1	49 57 37.3	2 11.18	− 1 19.4	− 2 12 30.0	+ 2.61	0.9614297	0.9481354	0.9465587
5	50 6 22.1	2 11.20	1 19.6	2 12 19.6	2.62	0.9613902	0.9449898	0.9434309
9	50 15 7.0	2 11.23	1 19.9	2 12 9.1	2.64	0.9613508	0.9418838	0.9403509
13	50 23 52.0	2 11.25	1 20.2	2 11 58.5	2.65	0.9613115	0.9388342	0.9373358
17	50 32 37.0	2 11.28	1 20.5	2 11 47.8	2.66	0.9612723	0.9358582	0.9344035
21	50 41 22.1	2 11.30	− 1 20.8	− 2 11 37.2	+ 2.67	0.9612333	0.9329737	0.9315710
25	50 50 7.3	2 11.32	1 21.0	2 11 26.4	2.69	0.9611943	0.9301975	0.9288550
29	50 58 52.6	2 11.34	1 21.3	2 11 15.7	2.70	0.9611554	0.9275457	0.9262716
Oct. 3	51 7 38.0	2 11.37	1 21.6	2 11 4.9	2.71	0.9611166	0.9250347	0.9238372
7	51 16 23.6	2 11.39	1 21.8	2 10 54.0	2.72	0.9610779	0.9226814	0.9215692
11	51 25 9.2	2 11.41	− 1 22.1	− 2 10 43.1	+ 2.74	0.9610394	0.9205030	0.9194849
15	51 33 54.9	2 11.43	1 22.4	2 10 32.1	2.75	0.9610009	0.9185168	0.9176007
19	51 42 40.7	2 11.45	1 22.6	2 10 21.1	2.77	0.9609625	0.9167380	0.9159306
23	51 51 26.6	2 11.48	1 22.9	2 10 10.0	2.78	0.9609242	0.9151799	0.9144872
27	52 0 12.5	2 11.50	1 23.2	2 9 58.8	2.79	0.9608860	0.9138538	0.9132808
31	52 8 58.5	2 11.52	− 1 23.4	− 2 9 47.6	+ 2.81	0.9608479	0.9127697	0.9123214
Nov. 4	52 17 44.6	2 11.54	1 23.7	2 9 36.3	2.82	0.9608099	0.9119370	0.9116177
8	52 26 30.8	2 11.56	1 23.9	2 9 25.0	2.83	0.9607721	0.9113642	0.9111773
12	52 35 17.1	2 11.59	1 24.2	2 9 13.7	2.84	0.9607344	0.9110573	0.9110048
16	52 44 3.5	2 11.61	1 24.4	2 9 2.3	2.86	0.9606968	0.9110198	0.9111021
20	52 52 50.0	2 11.63	− 1 24.7	− 2 8 50.8	+ 2.87	0.9606593	0.9112514	0.9114674
24	53 1 36.6	2 11.65	1 24.9	2 8 39.3	2.88	0.9606219	0.9117496	0.9120973
28	53 10 23.3	2 11.67	1 25.2	2 8 27.7	2.90	0.9605846	0.9125099	0.9129868
Dec. 2	53 19 10.0	2 11.70	1 25.4	2 8 16.1	2.91	0.9605474	0.9135271	0.9141301
6	53 27 56.8	2 11.72	1 25.6	2 8 4.4	2.92	0.9605103	0.9147945	0.9155192
10	53 36 43.7	2 11.74	1 25.9	2 7 52.7	2.94	0.9604733	0.9163028	0.9171437
14	53 45 30.7	2 11.76	− 1 26.1	− 2 7 41.0	+ 2.95	0.9604364	0.9180400	0.9189902
18	53 54 17.8	2 11.78	1 26.3	2 7 29.1	2.96	0.9603996	0.9199921	0.9210437
22	54 3 5.0	2 11.81	1 26.6	2 7 17.2	2.98	0.9603629	0.9221431	0.9232881
26	54 11 52.3	2 11.83	1 26.8	2 7 5.3	2.99	0.9603263	0.9244767	0.9257069
30	54 20 39.6	2 11.85	1 27.0	2 6 53.3	3.00	0.9602899	0.9269768	0.9282842
34	54 29 27.0	2 11.87	− 1 27.2	− 2 6 41.3	+ 3.01	0.9602535	0.9296269	

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 0	165 40 7.7	46.59	− 0.73	+ 0 46 18.9	− 0.02	1.2619959	1.2528003	1.2512611
8	165 46 20.4	46.59	0.77	0 46 18.7	0.02	1.2619952	1.2497679	1.2483286
16	165 52 33.1	46.59	0.80	0 46 18.5	0.03	1.2619946	1.2469513	1.2456448
24	165 58 45 8	46.59	0.84	0 46 18.3	0.03	1.2619941	1.2444173	1.2432758
Feb. 1	166 4 58.5	46.59	0.87	0 46 18.1	0.03	1.2619936	1.2422262	1.2412745
9	166 11 11.2	46.59	− 0.90	+ 0 46 17.8	− 0.03	1.2619932	1.2404267	1.2396878
17	166 17 24.0	46.59	0.94	0 46 17.6	0.03	1.2619929	1.2390625	1.2385552
25	166 23 36.7	46.59	0.97	0 46 17.4	0.03	1.2619926	1.2381691	1.2379054
Mar. 5	166 29 49.5	46.60	1.00	0 46 17.1	0.03	1.2619924	1.2377650	1.2377484
13	166 36 2.3	46.60	1.04	0 46 16.8	0.03	1.2619923	1.2378554	1.2380856
21	166 42 15.0	46.60	− 1.07	+ 0 46 16.5	− 0.03	1.2619922	1.2384372	1.2389076
29	166 48 27.8	46.60	1.10	0 46 16.2	0.04	1.2619922	1.2394932	1.2401895
April 6	166 54 40.6	46.60	1.14	0 46 15.9	0.04	1.2619923	1.2409916	1.2418944
14	167 0 53.4	46.60	1.17	0 46 15.6	0.04	1.2619924	1.2428927	1.2439609
22	167 7 6.2	46.60	1.20	0 46 15.3	0.04	1.2619926	1.2451524	1.2463997
30	167 13 19.0	46.60	− 1.23	+ 0 46 15.0	− 0.04	1.2619929	1.2477149	1.2490905
May 8	167 19 31.8	46.60	1.26	0 46 14.7	0.04	1.2619932	1.2505195	1.2519953
16	167 25 44.6	46.60	1.30	0 46 14.3	0.04	1.2619936	1.2535102	1.2550560
24	167 31 57.5	46.60	1.33	0 46 14.0	0.04	1.2619941	1.2566246	1.2582083
June 1	167 38 10.3	46.61	1.36	0 46 13.6	0.05	1.2619946	1.2597999	1.2613924
9	167 44 23.1	46.61	− 1.40	+ 0 46 13.3	− 0.05	1.2619952	1.2629789	1.2645529
17	167 50 36.0	46.61	1.43	0 46 12.9	0.05	1.2619958	1.2661080	1.2676364
25	167 56 48.9	46.61	1.47	0 46 12.5	0.05	1.2619965	1.2691323	1.2705896
July 3	168 3 1.7	46.61	1.50	0 46 12.1	0.05	1.2619973	1.2720034	1.2733687
11	168 9 14.6	46.61	1.54	0 46 11.7	0.05	1.2619982	1.2746803	1.2759331
19	168 15 27.5	46.61	− 1.58	+ 0 46 11.3	− 0.05	1.2619991	1.2771222	1.2782431
27	168 21 40.4	46.61	1.62	0 46 10.9	0.05	1.2620001	1.2792922	1.2802661
Aug. 4	168 27 53.3	46.61	1.65	0 46 10.4	0.05	1.2620011	1.2811617	1.2819761
12	168 34 6.2	46.61	1.68	0 46 10.0	0 05	1.2620022	1.2827062	1.2833491
20	168 40 19.1	46.61	1.72	0 46 9.5	0.06	1.2620034	1.2839019	1.2843629
28	168 46 32.0	46.61	− 1.75	+ 0 46 9.1	− 0.06	1.2620046	1.2847311	1.2850054
Sept. 5	168 52 44.9	46.61	1.78	0 46 8.6	0.06	1.2620059	1.2851845	1.2852673
13	168 58 57.8	46.62	1.82	0 46 8.1	0.06	1.2620073	1.2852525	1.2851400
21	169 5 10.7	46.62	1.85	0 46 7.6	0.06	1.2620087	1.2849300	1.2846233
29	169 11 23.7	46.62	1.88	0 46 7.2	0.06	1.2620102	1.2842207	1.2837236
Oct. 7	169 17 36.6	46.62	− 1.92	+ 0 46 6.7	− 0.06	1.2620118	1.2831327	1.2824483
15	169 23 49.6	46.62	1.95	0 46 6.1	0.06	1.2620131	1.2816734	1.2808107
23	169 30 2.5	46.62	1.98	0 46 5.6	0.07	1.2620151	1.2798632	1.2788341
31	169 36 15.5	46.62	2.02	0 46 5.1	0.07	1.2620169	1.2777268	1.2765445
Nov. 8	169 42 28.5	46.62	2 05	0 46 4.5	0.07	1.2620187	1.2752011	1.2739713
16	169 48 41.4	46.62	2.08	0 46 4.0	0.07	1.2620205	1.2725907	1.2711549
24	169 54 54.4	46.62	− 2.12	+ 0 46 3.4	− 0.07	1.2620225	1.2696700	1.2681419
Dec. 2	170 1 7.4	46.62	2.15	0 46 2.9	0.07	1.2620245	1.2665766	1.2649806
10	170 7 20.4	46.62	2.18	0 46 2.3	0.07	1.2620266	1.2633611	1.2617262
18	170 13 33.4	46.62	2.22	0 46 1.7	0.07	1.2620287	1.2600841	1.2584427
26	170 19 46.4	46.62	2.25	0 46 1.1	0.08	1.2620309	1.2568098	1.2551932
34	170 25 59.4	46.63	− 2.28	+ 0 46 0.5	− 0.08	1.2620331	1.2536009	

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 0	45 29 20.9	22.11	− 8.7	− 1 46 26.6	+ 0.06	1.4745296	1.4663084	1.4671820
8	45 32 17.8	22.11	8.8	1 46 26.1	0.06	1.4745296	1.4680915	1.4690307
16	45 35 14.6	22.11	8.8	1 46 25.6	0.06	1.4745296	1.4699946	1.4709775
24	45 38 11.5	22.11	8.9	1 46 25.1	0.06	1.4745296	1.4719745	1.4729804
Feb. 1	45 41 8.4	22.11	9.0	1 46 24.6	0.06	1.4745296	1.4739903	1.4749995
9	45 44 5.2	22.11	− 9.1	− 1 46 24.1	+ 0.06	1.4745296	1.4760032	1.4769964
17	45 47 2.1	22.11	9.2	1 46 23.6	0.06	1.4745296	1.4779745	1.4789329
25	45 49 58.9	22.11	9.3	1 46 23.1	0.06	1.4745296	1.4798673	1.4807734
Mar. 5	45 52 55.8	22.11	9.3	1 46 22.6	0.06	1.4745295	1.4816472	1.4824853
13	45 55 52.7	22.11	9.4	1 46 22.1	0.07	1.4745295	1.4832844	1.4840412
21	45 58 49.5	22.11	− 9.5	− 1 46 21.5	+ 0.07	1.4745295	1.4847525	1.4854154
29	46 1 46.4	22.11	9.6	1 46 21.0	0.07	1.4745294	1.4860274	1.4865865
Apr. 6	46 4 43.2	22.11	9.7	1 46 20.4	0.07	1.4745294	1.4870907	1.4875382
14	46 7 40.1	22.11	9.8	1 46 19.9	0.07	1.4745294	1.4879276	1.4882572
22	46 10 36.9	22.11	9.8	1 46 19.3	0.07	1.4745293	1.4885258	1.4887326
30	46 13 33.8	22.11	− 9.9	− 1 46 18.8	+ 0.07	1.4745293	1.4888776	1.4889604
May 8	46 16 30.6	22.11	10.0	1 46 18.2	0.07	1.4745292	1.4889809	1.4889391
16	46 19 27.5	22.11	10.1	1 46 17.7	0.07	1.4745292	1.4888351	1.4886693
24	46 22 24.3	22.11	10.2	1 46 17.1	0.07	1.4745291	1.4884424	1.4881558
June 1	46 25 21.2	22.11	10.3	1 46 16.5	0.07	1.4745290	1.4878105	1.4874082
9	46 28 18.0	22.10	− 10.3	− 1 46 15.9	+ 0.07	1.4745289	1.4869503	1.4864386
17	46 31 14.8	22.10	10.4	1 46 15.4	0.08	1.4745288	1.4858748	1.4852607
25	46 34 11.6	22.11	10.5	1 46 14.8	0.08	1.4745287	1.4845987	1.4838924
July 3	46 37 8.5	22.10	10.6	1 46 14.2	0.08	1.4745286	1.4831445	1.4823576
11	46 40 5.3	22.10	10.7	1 46 13.6	0.08	1.4745285	1.4815338	1.4806765
19	46 43 2.1	22.11	− 10.7	− 1 46 13.0	+ 0.08	1.4745284	1.4797900	1.4788779
27	46 45 58.9	22.11	10.8	1 46 12.4	0.08	1.4745283	1.4779441	1.4769922
Aug. 4	46 48 55.8	22.11	10.9	1 46 11.8	0.08	1.4745282	1.4760263	1.4750501
12	46 51 52.6	22.11	11.0	1 46 11.1	0.08	1.4745280	1.4740683	1.4730850
20	46 54 49.5	22.10	11.1	1 46 10.5	0.08	1.4745279	1.4721048	1.4711326
28	46 57 46.3	22.10	− 11.2	− 1 46 9.9	+ 0.08	1.4745277	1.4701728	1.4692301
Sept. 5	47 0 43.1	22.10	11.2	1 46 9.3	0.08	1.4745275	1.4683087	1.4674134
13	47 3 39.9	22.10	11.3	1 46 8.6	0.08	1.4745273	1.4665484	1.4657190
21	47 6 36.7	22.10	11.4	1 46 8.0	0.08	1.4745271	1.4649292	1.4641836
29	47 9 33.5	22.10	11.5	1 46 7.4	0.08	1.4745269	1.4634858	1.4628399
Oct. 7	47 12 30.3	22.10	− 11.6	− 1 46 6.7	+ 0.09	1.4745267	1.4622492	1.4617175
15	47 15 27.1	22.10	11.7	1 46 6.0	0.09	1.4745265	1.4612477	1.4608435
23	47 18 23.9	22.10	11.7	1 46 5.4	0.09	1.4745263	1.4605067	1.4602397
31	47 21 20.7	22.10	11.8	1 46 4.7	0.09	1.4745261	1.4600439	1.4599211
Nov. 8	47 24 17.5	22.10	11.9	1 46 4.1	0.09	1.4745259	1.4598717	1.4598971
16	47 27 14.3	22.10	12.0	1 46 3.4	0.09	1.4745257	1.4599966	1.4601703
24	47 30 11.1	22.10	− 12.1	− 1 46 2.7	+ 0.09	1.4745255	1.4604167	1.4607350
Dec. 2	47 33 7.9	22.10	12.2	1 46 2.0	0.09	1.4745253	1.4611232	1.4615797
10	47 36 4.7	22.10	12.2	1 46 1.4	0.09	1.4745251	1.4621014	1.4626862
18	47 39 1.5	22.10	12.3	1 46 0.7	0.09	1.4745249	1.4633297	1.4640287
26	47 41 58.3	22.10	12.4	1 46 0.0	0.09	1.4745247	1.4647790	1.4655769
34	47 44 55.1	22.10	− 12.5	− 1 45 59.3	+ 0.09	1.4745244	1.4664180	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 1	+0.1884028	+0.1969768	− 782	−0.8853018	−0.8837292	− 65	−0.3840833	−0.3834012	− 234
2	0.2055353	0.2140777	787	0.8820860	0.8803784	79	0.3826895	0.3819482	240
3	0.2226034	0.2311117	792	0.8786008	0.8767552	95	0.3811773	0.3803770	246
4	0.2396020	0.2480738	796	0.8748417	0.8728605	110	0.3795471	0.3786878	251
5	0.2565262	0.2649590	800	0.8708118	0.8686955	125	0.3777991	0.3768812	257
6	+0.2733714	+0.2817626	− 804	−0.8665121	−0.8642616	− 141	−0.3759340	−0.3749579	− 264
7	0.2901323	0.2984797	808	0.8619441	0.8595600	157	0.3739526	0.3729182	269
8	0.3068042	0.3151052	811	0.8571090	0.8545916	173	0.3718549	0.3707627	274
9	0.3233821	0.3316340	814	0.8520079	0.8493580	189	0.3696417	0.3684920	280
10	0.3398608	0.3480616	817	0.8466420	0.8438602	205	0.3673136	0.3661066	285
11	+0 3562358	+0.3643828	− 819	−0.8410128	−0.8380999	− 221	−0.3648710	−0.3636071	− 291
12	0.3725018	0.3805921	820	0.8351217	0.8320782	237	0.3623147	0.3609941	296
13	0.3886532	0.3966843	821	0.8289700	0.8257972	253	0.3596453	0.3582683	302
14	0.4046849	0.4126540	821	0.8225599	0.8192583	270	0.3568635	0.3554308	307
15	0.4205915	0.4284964	821	0.8158927	0.8124633	287	0.3539703	0.3524823	313
16	+0.4363682	+0.4442061	− 821	−0.8089704	−0.8054144	− 304	−0.3509666	−0.3494235	− 318
17	0.4520096	0.4597779	820	0.8017955	0.7981139	321	0.3478531	0.3462556	324
18	0.4675104	0.4752065	819	0.7943701	0.7905643	339	0.3446311	0.3429796	329
19	0.4828654	0.4904869	818	0.7866968	0.7827678	356	0.3413015	0.3395967	334
20	0.4980700	0.5056142	816	0.7787776	0.7747267	374	0.3378654	0.3361078	339
21	+0.5131191	+0.5205837	− 814	−0.7706154	−0.7664440	− 391	−0.3343242	−0.3325145	− 344
22	0.5280076	0.5353901	811	0.7622131	0.7579230	409	0.3306790	0.3288177	350
23	0.5427307	0.5500287	808	0.7535739	0.7491664	427	0.3269310	0.3250189	355
24	0.5572837	0.5644951	804	0.7447010	0.7401778	445	0.3230817	0.3211196	360
25	0.5716625	0.5787849	800	0.7355972	0.7309598	463	0.3191325	0.3171209	365
26	+0.5858624	+0.5928941	− 795	−0.7262660	−0.7215161	− 480	−0.3150848	−0.3130243	− 371
27	0.5998794	0.6068180	790	0.7167107	0.7118498	498	0.3109398	0.3088312	376
28	0.6137095	0.6205530	784	0.7069342	0.7019641	515	0.3066990	0.3045431	381
29	0.6273486	0.6340955	778	0.6969402	0.6918626	533	0.3023639	0.3001614	386
30	0.6407932	0.6474414	772	0.6867320	0.6815485	550	0.2979358	0.2956874	391
31	+0.6540393	+0.6605867	− 766	−0.6763128	−0.6710251	− 568	−0.2934163	−0.2911226	− 396
Feb. 1	0.6670834	0.6735288	759	0.6656862	0.6602960	585	0.2888065	0.2864683	401
2	0.6799223	0.6862634	751	0.6548554	0.6493643	602	0.2841080	0.2817259	406
3	0.6925517	0.6987870	743	0.6438234	0.6382329	619	0.2793220	0.2768967	410
4	0.7049686	0.7110963	734	0.6325935	0.6269054	636	0.2744502	0.2719826	415
5	+0.7171695	+0.7231879	− 725	−0.6211693	−0.6153853	− 653	−0.2694940	−0.2669846	− 419
6	0.7291508	0.7350581	715	0.6095541	0.6036758	670	0.2644547	0.2619044	424
7	0.7409091	0.7467035	705	0.5977510	0.5917803	687	0.2593338	0.2567431	428
8	0.7524405	0.7581202	695	0.5857638	0.5797023	704	0.2541327	0.2515027	433
9	0.7637418	0.7693050	685	0.5735959	0.5674453	720	0.2488532	0.2461844	437
10	+0.7748094	+0.7802545	− 674	−0.5612506	−0.5550127	− 737	−0.2434966	−0.2407899	− 441
11	0.7856398	0.7909648	662	0.5487316	0.5424080	754	0.2380645	0.2353207	445
12	0.7962294	0.8014329	650	0.5360422	0.5296349	770	0.2325587	0.2297786	449
13	0.8065750	0.8116549	638	0.5231867	0.5160978	786	0.2269808	0.2241653	452
14	0.8166726	0.8216275	625	0.5101690	0.5036008	802	0.2213325	0.2184826	456
15	+0.8265193	+0.8313476	− 612	−0.4969935	−0.4903479	− 817	−0.2156158	−0.2127323	− 460

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.8265193	+0.8313476	− 612	−0.4969935	−0.4903479	− 817	−0.2156158	−0.2127323	− 460
16	0.8361119	0.8408119	598	0.4836642	0.4769432	833	0.2098325	0.2069165	464
17	0.8454476	0.8500181	584	0.4701853	0.4633914	848	0.2039846	0.2010371	467
18	0.8545232	0.8589627	570	0.4565618	0.4496971	863	0.1980741	0.1950957	471
19	0.8633358	0.8676425	555	0.4427981	0.4358649	877	0.1921026	0.1890949	474
20	+0.8718824	+0.8760552	− 540	−0.4288984	−0.4218992	− 891	−0.1860725	−0.1830360	− 477
21	0 8801609	0.8841988	525	0.4148676	0.4078044	905	0.1799857	0.1769217	480
22	0.8881691	0.8920712	509	0.4007103	0.3935858	919	0.1738441	0.1707535	483
23	0.8959048	0.8996698	493	0.3864314	0.3792477	933	0.1676498	0.1645334	485
24	0.9033662	0.9069935	478	0.3720355	0.3647953	946	0.1614048	0.1582639	488
25	+0.9105513	+0.9140397	− 461	−0.3575275	−0.3502328	− 959	−0.1551110	−0.1519466	− 490
26	0.9174584	0.9208072	444	0.3429119	0.3355651	972	0.1487708	0.1455837	493
27	0.9240861	0.9272945	427	0.3281933	0.3207969	984	0.1423859	0.1391774	495
28	0.9304327	0.9335002	409	0.3133766	0.3059328	996	0.1359583	0.1327292	497
Mar. 1	0.9364968	0.9394226	391	0.2984662	0.2909774	1008	0.1294900	0.1262412	499
2	+0.9422772	+0.9450606	− 373	−0.2834667	−0.2759350	−1021	−0.1229828	−0.1197153	− 501
3	0.9477726	0.9504131	354	0.2683823	0.2608096	1032	0.1164387	0.1131533	502
4	0.9529820	0.9554793	335	0.2532172	0.2456060	1043	0.1098595	0.1065573	504
5	0.9579047	0.9602581	316	0.2379760	0.2303281	1053	0.1032471	0.0999289	505
6	0.9625393	0.9647482	297	0.2226629	0.2149807	1063	0.0966031	0.0932700	506
7	+0.9668844	+0.9689479	− 277	−0.2072822	−0.1995680	−1073	−0.0899297	−0.0865827	− 507
8	0.9709384	0.9728560	257	0.1918385	0.1840943	1083	0.0832290	0.0798689	508
9	0.9747005	0.9764717	237	0.1763361	0.1685642	1092	0.0765025	0.0731303	509
10	0.9781695	0.9797938	217	0.1607794	0.1529823	1101	0.0697526	0.0663694	510
11	0.9813445	0 9828215	196	0.1451734	0.1373532	1110	0.0629811	0.0595879	511
12	+0.9842246	+0.9855537	− 176	−0.1295222	−0.1216810	−1118	−0.0561901	−0.0527879	− 512
13	0.9868087	0.9879893	155	0.1138301	0.1059702	1126	0.0493816	0.0459714	512
14	0.9890951	0.9901266	134	0.0981019	0.0902259	1135	0.0425576	0.0391406	512
15	0.9910836	0.9919659	113	0.0823431	0.0744537	1142	0.0357204	0.0322975	512
16	0.9927736	0.9935067	93	0.0665584	0.0586580	1149	0.0288721	0.0254443	512
17	+0.9941649	+0.9947482	− 71	−0.0507529	−0.0428436	−1155	−0.0220146	−0.0185832	− 512
18	0.9952567	0.9956903	49	0.0349309	0.0270154	1161	0.0151503	0.0117163	512
19	0.9960489	0.9963325	27	0.0190979	−0.0111790	1167	0.0082815	−0.0048459	511
20	0.9965413	0.9966751	− 5	−0.0032594	+0.0046603	1173	−0.0014103	+0.0020254	510
21	0.9967341	0.9967182	+ 17	+0.0125796	0.0204978	1178	+0.0054610	0.0088959	509
22	+0.9966276	+0.9964622	+ 39	+0.0284143	+0.0363283	−1183	+0.0123301	+0.0157634	− 508
23	0.9962222	0.9959077	62	0.0442395	0.0521472	1187	0.0191952	0.0226255	506
24	0.9955187	0.9950654	85	0.0600507	0.0679493	1191	0.0260540	0.0294806	505
25	0.9945179	0.9939060	108	0.0758425	0.0837298	1195	0.0329047	0.0363262	503
26	0.9932202	0.9924605	131	0.0916105	0.0994840	1198	0.0397449	0.0431604	501
27	+0.9916272	+0.9907202	+ 154	+0.1073497	+0.1152071	−1201	+0.0465726	+0.0499813	− 499
28	0.9897400	0.9886864	177	0.1230556	0.1308945	1205	0.0533861	0.0567868	497
29	0.9875597	0.9863600	200	0.1387234	0.1465416	1207	0.0601832	0.0635751	494
30	0.9850873	0.9837419	223	0.1543488	0.1621444	1209	0.0669621	0.0703443	492
31	0.9823239	0.9808334	246	0.1699278	0.1776982	1211	0.0737210	0.0770922	490
32	+0.9792706	+0.9776359	+ 269	+0.1854554	+0.1931988	−1213	+0.0804577	+0.0838171	− 487

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
April 1	+0.9792706	+0.9776359	+ 269	+0.1854554	+0.1931988	−1213	+0.0804577	+0.0838171	− 487
2	0.9759293	0.9741510	293	0.2009280	0.2086423	1214	0.0871705	0.0905175	484
3	0.9723010	0.9703796	316	0.2163411	0.2240242	1214	0.0938578	0.0971913	481
4	0.9683870	0.9663233	340	0.2316909	0.2393406	1214	0.1005177	0.1038368	477
5	0.9641887	0.9619833	364	0.2469730	0.2545874	1215	0.1071485	0.1104522	473
6	+0.9597074	+0.9573609	+ 388	+0.2621831	+0.2697598	−1215	+0.1137479	+0.1170354	− 469
7	0.9549441	0.9524571	412	0.2773171	0.2848542	1215	0.1203145	0.1235847	465
8	0.9499001	0.9472734	436	0.2923708	0.2998661	1214	0.1268460	0.1300982	461
9	0.9445771	0.9418115	460	0.3073399	0.3147914	1213	0.1333409	0.1365739	457
10	0.9389767	0.9360726	484	0.3222201	0.3296255	1212	0.1397970	0.1430101	453
11	+0.9330998	+0.9300582	+ 508	+0 3370072	+0.3443644	−1210	+0.1462128	+0.1494048	− 449
12	0.9269481	0.9237696	532	0.3516968	0.3590037	1209	0.1525862	0.1557563	444
13	0.9205231	0.9172089	556	0.3662846	0.3735388	1206	0.1589150	0.1620621	439
14	0.9138273	0.9103785	580	0.3807659	0.3879652	1203	0.1651975	0.1683208	434
15	0.9068627	0.9032801	604	0.3951362	0.4022784	1200	0.1714318	0.1745303	429
16	+0.8996312	+0.8959162	+ 628	+0.4093912	+0.4164741	−1196	+0.1776159	+0.1806885	− 423
17	0.8921351	0.8882888	652	0.4235265	0.4305478	1192	0.1837479	0.1867938	418
18	0.8843772	0.8804009	676	0.4375375	0.4444952	1187	0.1898259	0.1928440	412
19	0.8763601	0.8722549	700	0.4514203	0.4583124	1182	0.1958481	0.1988377	406
20	0.8680860	0.8638536	724	0.4651708	0.4719948	1177	0.2018127	0.2047729	400
21	+0.8595583	+0.8552003	+ 748	+0.4787842	+0.4855384	−1171	+0.2077181	+0.2106480	− 394
22	0.8507800	0.8462978	772	0.4922569	0.4989391	1165	0.2135625	0.2164612	388
23	0.8417542	0.8371494	796	0.5055847	0.5121934	1159	0.2193442	0.2222109	381
24	0.8324840	0.8277583	820	0.5187644	0 5252976	1152	0.2250614	0.2278955	374
25	0.8229725	0.8181273	844	0.5317923	0.5382480	1146	0.2307129	0.2335136	367
26	+0.8132231	+0.8082603	+ 867	+0.5446645	+0.5510412	−1138	+0.2362971	+0.2390635	− 360
27	0.8032394	0.7981606	891	0.5573775	0.5636731	1130	0.2418124	0.2445438	353
28	0.7930246	0.7878315	914	0.5699279	0.5761416	1122	0.2472574	0.2499530	346
29	0.7825819	0.7772761	938	0.5823134	0.5884432	1114	0.2526307	0.2552901	339
30	0.7719143	0.7664972	961	0.5945306	0.6005752	1105	0.2579313	0.2605538	331
May 1	+0.7610250	+0.7554982	+ 985	+0.6065765	+0.6125341	−1096	+0.2631575	+0.2657427	− 323
2	0.7499173	0.7442826	1008	0.6184476	0.6243164	1086	0.2683085	0.2708550	315
3	0.7385946	0.7326535	1031	0.6301404	0.6359194	1076	0.2733820	0.2758895	307
4	0.7270599	0.7212141	1054	0.6416528	0.6473403	1065	0.2783772	0.2808451	298
5	0.7153166	0.7093677	1077	0.6529817	0.6585766	1054	0.2832929	0.2857204	290
6	+0.7033676	+0.6973171	+1100	+0.6641244	+0.6696249	−1044	+0.2881275	+0.2905139	− 281
7	0.6912163	0.6850657	1123	0.6750776	0.6804822	1032	0.2928798	0.2952246	272
8	0.6788657	0.6726168	1145	0.6858384	0.6911455	1020	0.2975485	0.2998510	263
9	0.6663194	0.6599737	1168	0.6964034	0.7016114	1008	0.3021322	0.3043918	254
10	0.6535806	0.6471400	1190	0.7067696	0.7118771	995	0.3066295	0.3088454	244
11	+0.6406529	+0.6341195	+1213	+0.7169338	+0.7219391	− 982	+0.3110391	+0.3132106	− 235
12	0.6275403	0.6209159	1235	0.7268928	0.7317944	968	0.3153596	0.3174860	225
13	0.6142465	0.6075326	1257	0.7366436	0.7414402	954	0.3195896	0.3216703	215
14	0.6007748	0.5939737	1279	0.7461836	0.7508738	940	0.3237278	0.3257623	205
15	0.5871296	0.5802432	1302	0.7555101	0.7600922	925	0.3277733	0.3297608	195
16	+0.5733149	+0.5663456	+1323	+0.7646197	+0.7690923	− 910	+0.3317245	+0.3336645	− 185

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 17	+0.5593354	+0.5522851	+1344	+0.7735098	+0.7778717	− 895	+0.3355807	+0.3374726	− 175
18	0.5451952	0.5380660	1365	0.7821777	0.7864273	879	0.3393402	0.3411835	164
19	0.5308984	0.5236927	1386	0.7906206	0.7947571	864	0.3430022	0.3447963	154
20	0.5164497	0.5091699	1407	0.7988365	0.8028585	847	0.3465657	0.3483104	143
21	0.5018540	0.4945024	1427	0.8068230	0.8107295	830	0.3500302	0.3517247	133
22	+0.4871156	+0.4796946	+1447	+0.8145780	+0.8183682	− 812	+0.3533941	+0.3550381	− 122
23	0.4722397	0.4647513	1467	0.8220998	0.8257725	794	0.3566568	0 3582500	111
24	0.4572302	0.4496771	1487	0.8293862	0.8329407	776	0.3598176	0.3613596	100
25	0.4420922	0.4344762	1506	0.8364358	0.8398712	757	0.3628759	0.3643663	89
26	0.4268298	0.4191533	1525	0.8432467	0.8465622	738	0.3658309	0.3672695	78
27	+0.4114474	+0.4037127	+1544	+0.8498177	+0.8530131	− 719	+0.3686819	+0.3700683	− 67
28	0.3959496	0.3881587	1563	0.8561478	0.8592219	699	0.3714285	0.3727623	55
29	0.3803407	0.3724960	1582	0.8622353	0.8651875	679	0.3740699	0.3753510	44
30	0.3646253	0.3567291	1600	0.8680786	0.8709083	658	0.3766054	0.3778333	33
31	0.3488078	0.3408621	1618	0.8736765	0.8763831	638	0.3790346	0.3802091	21
June 1	+0.3328923	+0.3248989	+1635	+0.8790281	+0.8816109	− 616	+0.3813569	+0.3824776	− 9
2	0.3168825	0.3088439	1652	0.8841316	0.8865901	594	0.3835715	0.3846383	+ 3
3	0.3007833	0.2927016	1670	0.8889863	0.8913197	572	0.3856780	0.3866905	15
4	0.2845989	0.2764759	1686	0.8935903	0.8957980	549	0.3876758	0.3886338	27
5	0.2683332	0.2601711	1702	0.8979427	0.9000243	526	0.3895645	0.3904675	39
6	+0.2519904	+0.2437916	+1718	+0.9020425	+0.9039972	− 503	+0.3913431	+0.3921910	+ 51
7	0.2355752	0.2273417	1733	0.9058881	0.9077151	479	0.3930113	0.3938039	64
8	0 2190919	0.2106263	1748	0.9094782	0.9111773	455	0.3945687	0.3953055	76
9	0.2025454	0.1942498	1762	0.9128120	0.9143822	430	0.3960145	0.3966955	89
10	0.1859402	0.1776169	1776	0.9158878	0.9173286	406	0.3973484	0.3979733	101
11	+0.1692805	+0.1609318	+1789	+0.9187044	+0.9200152	− 380	+0.3985698	+0.3991381	+ 114
12	0.1525715	0.1441999	1802	0.9212605	0.9224407	354	0.3996781	0.4001897	126
13	0.1358179	0.1274262	1815	0.9235556	0.9246051	328	0.4006730	0.4011279	139
14	0.1190253	0.1106157	1828	0.9255891	0.9265076	302	0.4015544	0.4019524	151
15	0.1021981	0.0937732	1839	0.9273603	0.9281472	275	0.4023220	0.4026629	164
16	+0.0853417	+0.0769040	+1850	+0.9288681	+0.9295231	− 248	+0.4029753	+0.4032592	+ 177
17	0.0684610	0.0600131	1861	0.9301122	0.9306355	220	0.4035144	0.4037412	190
18	0.0515611	0.0431058	1871	0.9310928	0.9314841	192	0.4039393	0.4041089	203
19	0.0346477	0.0261874	1881	0.9318094	0.9320686	164	0.4042499	0.4043623	216
20	0.0177256	+0.0092629	1890	0.9322619	0.9323892	136	0.4044461	0.4045013	229
21	+0.0008000	−0.0076626	+1899	+0.9324505	+0.9324459	− 107	+0.4045279	+0.4045260	+ 242
22	−0.0161244	0.0245846	1908	0.9323756	0.9322394	78	0.4044955	0.4044365	255
23	0.0330426	0.0414978	1915	0.9320376	0.9317702	49	0.4043490	0.4042330	268
24	0.0499497	0.0583976	1922	0.9314372	0.9310386	− 19	0.4040887	0.4039161	281
25	0.0668411	0.0752796	1929	0.9305747	0.9300455	+ 11	0.4037151	0.4034859	294
26	−0.0837125	−0.0921393	+1935	+0.9294509	+0.9287911	+ 40	+0.4032283	+0.4029424	+ 307
27	0.1005595	0.1089723	1940	0.9280663	0.9272763	71	0.4026283	0.4022860	320
28	0.1173773	0.1257739	1945	0.9264212	0.9255014	102	0.4019156	0.4015165	333
29	0.1341615	0.1425394	1949	0.9245167	0.9234673	132	0.4010895	0.4006346	346
30	0.1509073	0.1592647	1952	0.9223532	0.9211747	163	0.4001516	0.3996405	359
31	−0.1676107	−0.1759451	+1955	+0.9199316	+0.9186242	+ 195	+0.3991015	+0.3985346	+ 372

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.1676107	−0.1759451	+1955	+0.9199316	+0.9186242	+ 195	+0.3991015	+ 0.3985346	+ 372
2	0.1842672	0.1925767	1959	0.9172526	0.9158167	226	0.3979397	0.3973169	385
3	0.2008730	0.2091555	1961	0.9143168	0.9127528	258	0.3966664	0.3959879	397
4	0.2174235	0.2256764	1961	0.9111249	0.9094329	290	0.3952817	0.3945476	410
5	0.2339137	0.2421350	1961	0.9076771	0.9058576	322	0.3937857	0.3929961	423
6	−0.2503396	−0.2585269	+1961	+0.9039743	+0.9020274	+ 354	+0.3921788	+0.3913341	+ 436
7	0.2666965	0.2748478	1961	0.9000171	0.8979431	387	0.3904617	0.3895618	449
8	0.2829802	0.2910931	1959	0.8958060	0.8936058	419	0.3886344	0.3876795	462
9	0.2991858	0.3072577	1958	0.8913425	0.8890163	452	0.3866973	0.3856878	475
10	0.3153083	0.3233369	1955	0 8866272	0.8841754	484	0.3846510	0.3835869	488
11	−0.3313429	−0.3393257	+1952	+0.8816611	+0.8790843	+ 517	+0.3824958	+0.3813776	+ 500
12	0.3472849	0.3552198	1948	0.8764453	0.8737443	550	0.3802324	0.3790604	513
13	0.3631297	0.3710140	1943	0.8709814	0.8681568	583	0.3778614	0 3766356	525
14	0.3788722	0.3867037	1937	0.8652707	0.8623231	616	0.3753832	0.3741043	537
15	0.3945079	0.4022840	1931	0.8593143	0.8562446	649	0.3727988	0.3714668	549
16	−0.4100316	−0.4177501	+1925	+0.8531142	+0.8499233	+ 682	+0.3701084	+0.3687240	+ 561
17	0.4254388	0.4330972	1917	0.8466723	0.8433614	715	0.3673134	0.3658768	573
18	0.4407247	0.4483209	1909	0.8399908	0.8365607	748	0.3644144	0.3629263	586
19	0.4558852	0.4634170	1900	0.8330713	0.8295229	782	0.3614126	0.3598735	597
20	0.4709156	0.4783806	1890	0.8259158	0.8222507	815	0.3583089	0.3567190	609
21	−0.4858114	−0.4932075	+1879	+0.8185274	+0.8147469	+ 848	+0.3551041	+0.3534642	+ 621
22	0.5005684	0.5078936	1869	0.8109085	0.8070133	881	0.3517994	0.3501097	633
23	0.5151828	0.5224353	1857	0.8030615	0.7990531	913	0.3483955	0.3466568	644
24	0.5296505	0.5368280	1844	0.7949884	0.7908678	946	0.3448938	0.3431066	656
25	0.5439674	0.5510681	1831	0.7866916	0.7824603	978	0.3412953	0.3394600	667
26	−0.5581296	−0.5651516	+1817	+0.7781741	+0.7738333	+1010	+0.3376009	+0.3357181	+ 678
27	0.5721339	0.5790759	1803	0.7694381	0.7649888	1042	0.3338116	0.3318816	689
28	0.5859770	0.5928367	1788	0.7604857	0.7559293	1074	0.3299283	0.3279519	700
29	0.5996542	0.6064300	1772	0.7513197	0.7466572	1106	0.3259522	0.3239296	710
30	0.6131628	0.6198523	1755	0.7419425	0.7371757	1138	0.3218843	0.3198163	721
31	−0.6264981	−0.6330998	+1738	+0.7323569	+0.7274865	+1170	+0.3177256	+0.3156128	+ 731
Aug. 1	0.6396572	0.6461697	1720	0.7225650	0.7175924	1201	0.3134775	0.3113201	741
2	0.6526368	0.6590582	1701	0.7125689	0.7074951	1232	0.3091407	0.3069394	751
3	0.6654334	0.6717619	1681	0.7023711	0.6971974	1263	0.3047163	0.3024716	761
4	0.6780431	0.6842765	1661	0.6919745	0.6867024	1294	0.3002055	0.2979179	770
5	−0.6904617	−0.6965981	+1641	+0.6813817	+0.6760122	+1325	+0.2956093	+0.2932796	+ 780
6	0.7026854	0.7087232	1620	0.6705946	0.6651292	1356	0.2909289	0.2885574	789
7	0.7147110	0.7206484	1598	0.6596162	0.6540561	1386	0.2861653	0.2837528	799
8	0.7265349	0.7323698	1575	0.6484492	0.6427958	1415	0.2813200	0.2788670	808
9	0.7381527	0.7438831	1552	0.6370965	0.6313515	1444	0.2763941	0.2739014	817
10	−0.7495607	−0.7551849	+1528	+0.6255611	+0.6197257	+1473	+0.2713890	+0.2688572	+ 826
11	0.7607555	0.7662719	1503	0.6138459	0.6079223	1502	0.2663061	0.2637359	835
12	0.7717335	0.7771400	1479	0.6019554	0.5959452	1531	0.2611471	0.2585395	843
13	0.7824910	0.7877859	1453	0.5898922	0.5837967	1558	0.2559134	0.2532690	851
14	0.7930244	0.7982061	1426	0.5776593	0.5714806	1585	0.2506064	0.2479259	859
15	−0.8033306	−0.8083975	+1399	+0.5652609	+0.5590009	+1612	+0.2452276	+0.2425119	+ 867

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.8134064	−0.8183569	+1371	+0.5527009	+0.5463612	+1638	+0.2397789	+0.2370287	+ 875
17	0.8232485	0.8280808	1342	0.5399825	0.5335653	1664	0.2342617	0.2314780	883
18	0.8328534	0.8375661	1313	0.5271100	0.5206174	1691	0.2286776	0.2258610	890
19	0.8422187	0.8468109	1284	0.5140877	0.5075213	1716	0.2230285	0.2201802	897
20	0.8513422	0.8558124	1255	0.5009189	0.4942809	1741	0.2173162	0.2144367	904
21	−0.8602211	−0.8645681	+1224	+0.4876080	+0.4809005	+1766	+0.2115420	+0.2086324	+ 910
22	0.8688529	0.8730753	1193	0.4741590	0.4673839	1790	0.2057081	0.2027691	916
23	0.8772350	0.8813319	1162	0.4605757	0.4537347	1813	0.1998157	0.1968482	922
24	0.8853657	0.8893360	1130	0.4468616	0.4399566	1836	0.1938666	0.1908713	928
25	0.8932428	0.8970855	1097	0.4330206	0.4260538	1858	0.1878624	0.1848401	933
26	−0.9008640	−0.9045782	+1064	+0.4190570	+0.4120303	+1880	+0.1818047	+0.1787563	+ 938
27	0.9082275	0.9118119	1030	0.4049746	0.3978898	1902	0.1756952	0.1726216	943
28	0.9153310	0.9187847	996	0.3907768	0.3836358	1923	0.1695357	0.1664376	948
29	0.9221728	0.9254950	962	0.3764674	0.3692718	1943	0.1633276	0.1602059	952
30	0.9287511	0.9319407	927	0.3620498	0.3548017	1963	0.1570725	0.1539277	956
31	−0.9350636	−0.9381195	+ 892	+0.3475280	+0.3402293	+1982	+0.1507719	+0.1476052	+ 960
Sept. 1	0.9411082	0.9440294	856	0.3329059	0.3255587	2001	0.1444278	0.1412400	964
2	0.9468829	0.9496683	820	0.3181880	0.3107942	2019	0.1380419	0.1348338	967
3	0.9523855	0.9550342	783	0.3033779	0.2959394	2036	0.1316159	0.1283883	970
4	0.9576143	0.9601253	746	0.2884791	0.2809975	2054	0.1251514	0.1219053	973
5	−0.9625670	−0.9649392	+ 709	+0.2734951	+0.2659726	+2071	+0.1186502	+0.1153863	+ 977
6	0.9672417	0.9694742	671	0.2584306	0.2508694	2086	0.1121140	0.1088335	979
7	0.9716365	0.9737284	632	0.2432896	0.2356918	2101	0.1055449	0.1022485	981
8	0.9757496	0.9777000	594	0.2280766	0.2204447	2115	0.0989445	0.0956333	983
9	0.9795791	0.9813870	555	0.2127965	0.2051325	2129	0.0923152	0.0889903	985
10	−0.9831234	−0.9847881	+ 516	+0.1974535	+0.1897597	+2142	+0.0856588	+0.0823210	+ 986
11	0.9863809	0.9879017	477	0.1820519	0.1743306	2155	0.0789770	0.0756271	987
12	0.9893504	0.9907268	438	0.1665964	0.1588501	2167	0.0722718	0.0689113	988
13	0.9920307	0.9932621	398	0.1510922	0.1433231	2179	0.0655457	0.0621753	989
14	0.9944207	0.9955066	358	0.1355438	0.1277547	2190	0.0588005	0.0554217	990
15	−0.9965195	−0.9974593	+ 317	+0.1199564	+0.1121494	+2200	+0.0520389	+0.0486523	+ 990
16	0.9983261	0.9991197	276	0.1043347	0.0965125	2209	0.0452622	0.0418691	990
17	0.9998402	1.0004874	235	0.0886835	0.0808484	2218	0.0384730	0.0350741	989
18	1.0010614	1.0015621	194	0.0730076	0.0651618	2227	0.0316729	0.0282695	988
19	1.0019897	1.0023438	152	0.0573116	0.0494577	2234	0.0248641	0.0214569	986
20	−1.0026245	−1.0028318	+ 111	+0.0416006	+0.0337406	+2241	+0.0180485	+0.0146388	+ 985
21	1.0029659	1.0030267	69	0.0258786	0.0180152	2247	0.0112283	0.0078171	983
22	1.0030142	1.0029283	+ 27	+0.0101509	+0.0022861	2252	+0.0044053	+0.0009934	982
23	1.0027690	1.0025364	− 15	−0.0055787	−0.0134427	2257	−0.0024186	−0.0058304	980
24	1.0022306	1.0018516	57	0.0213053	0.0291661	2261	0.0092416	0.0126520	977
25	−1.0013994	−1.0008739	− 99	−0.0370248	−0.0448807	+2265	−0.0160614	−0.0194696	+ 974
26	1.0002751	0.9996032	141	0.0527331	0.0605815	2268	0.0228765	0.0262816	971
27	0.9988582	0.9980401	184	0.0684252	0.0762639	2271	0.0296847	0.0330857	967
28	0.9971489	0.9961847	227	0.0840970	0.0919241	2273	0.0364844	0.0398804	963
29	0.9951474	0.9940370	270	0.0997446	0.1075582	2274	0.0432736	0.0466639	958
30	−0.9928535	−0.9915971	− 313	−0.1153642	−0.1231618	+2274	−0.0500507	−0.0534339	+ 954

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	–0.9902678	–0.9888655	– 355	–0.1309505	–0.1387299	+2273	–0.0568133	–0.0601887	+ 949
2	0.9873902	0.9858422	398	0.1464994	0.1542584	2272	0.0635597	0.0669261	944
3	0.9842214	0.9825278	441	0.1620062	0.1697425	2271	0.0702877	0.0736443	938
4	0.9807613	0.9789221	484	0.1774665	0.1851777	2268	0.0769955	0.0803411	932
5	0.9770102	0.9750258	526	0.1928756	0.2005596	2265	0.0836808	0.0870146	926
6	–0.9729689	–0.9708397	– 569	–0.2082292	–0.2158835	+2261	–0.0903420	–0.0936628	+ 919
7	0.9686384	0.9663649	612	0.2235221	0.2311445	2256	0.0969768	0.1002835	913
8	0.9640192	0.9616016	655	0.2387497	0.2463375	2251	0.1035829	0.1068747	906
9	0.9591121	0.9565508	698	0.2539070	0.2614578	2245	0.1101586	0.1134342	899
10	0.9539177	0.9512131	741	0.2689895	0.2765011	2239	0.1167015	0.1199602	893
11	–0.9484372	–0.9455903	– 783	–0.2839922	–0.2914621	+2232	–0.1232100	–0.1264504	+ 885
12	0.9426726	0.9396842	826	0.2989102	0.3063359	2225	0.1296813	0.1329024	877
13	0.9366252	0.9334962	868	0.3137385	0.3211176	2216	0.1361135	0.1393144	868
14	0.9302974	0.9270289	911	0.3284723	0.3358020	2207	0.1425047	0.1456842	859
15	0.9236908	0.9202834	953	0.3431062	0.3503846	2197	0.1488528	0.1520101	850
16	–0.9168069	–0.9132617	– 995	–0.3576365	–0.3648614	+2186	–0.1551558	–0.1582899	+ 841
17	0.9096480	0.9059662	1037	0.3720586	0.3792278	2175	0.1614120	0.1645219	831
18	0.9022165	0.8983993	1079	0.3863681	0.3934791	2164	0.1676194	0.1707043	821
19	0.8945149	0.8905637	1121	0.4005602	0.4076108	2152	0.1737761	0.1768347	810
20	0.8865458	0.8824616	1163	0.4146302	0.4216184	2139	0.1798800	0.1829116	799
21	–0.8783114	–0.8740955	–1204	–0.4285744	–0.4354982	+2125	–0.1859294	–0.1889332	+ 788
22	0.8698143	0.8654681	1245	0.4423890	0.4492463	2110	0.1919227	0.1948978	777
23	0.8610571	0.8565816	1286	0.4560698	0.4628587	2095	0.1978581	0.2008034	766
24	0.8520421	0.8474389	1327	0.4696127	0.4763313	2079	0.2037336	0.2066486	756
25	0.8427722	0.8380423	1367	0.4830140	0.4896604	2063	0.2095481	0.2124319	743
26	–0.8332496	–0.8283944	–1408	–0.4962700	–0.5028426	+2047	–0.2152997	–0.2181513	+ 732
27	0.8234770	0.8184977	1448	0.5093773	0.5158737	2030	0.2209866	0.2238051	719
28	0.8134568	0.8083548	1489	0.5223314	0.5287499	2012	0.2266071	0.2293921	706
29	0.8031920	0.7979685	1528	0.5351289	0.5414678	1993	0.2321597	0.2349099	693
30	0.7926847	0.7873410	1568	0.5477660	0.5540230	1974	0.2376426	0.2403574	680
31	–0.7819377	–0.7764752	–1607	–0.5602383	–0.5664117	+1954	–0.2430542	–0.2457327	+ 666
Nov. 1	0.7709538	0.7653738	1646	0.5725426	0.5786306	1933	0.2483927	0.2510340	652
2	0.7597357	0.7540398	1685	0.5846751	0.5906756	1913	0.2536562	0.2562593	638
3	0.7482863	0.7424757	1723	0.5966316	0.6025427	1891	0.2588432	0.2614075	624
4	0.7366084	0.7306847	1761	0.6084082	0.6142275	1868	0.2639520	0.2664764	609
5	–0.7247050	–0.7186698	–1799	–0.6200003	–0.6257262	+1845	–0.2689807	–0.2714646	+ 594
6	0.7125796	0.7064347	1836	0.6314045	0.6370350	1821	0.2739279	0.2763702	579
7	0.7002357	0.6939829	1873	0.6426168	0.6481498	1796	0.2787915	0.2811917	564
8	0.6876768	0.6813181	1909	0.6536334	0.6590673	1772	0.2835704	0.2859274	548
9	0.6749071	0.6684443	1945	0.6644503	0.6697828	1746	0.2882624	0.2905754	533
10	–0.6619302	–0.6553652	–1981	–0.6750638	–0.6802931	+1720	–0.2928661	–0.2951343	+ 517
11	0.6487500	0.6420850	2016	0.6854703	0.6905947	1693	0.2973798	0.2996024	502
12	0.6353707	0.6286077	2052	0.6956660	0.7006837	1665	0.3018021	0.3039784	485
13	0.6217966	0.6149378	2086	0.7056475	0.7105569	1636	0.3061317	0.3082612	468
14	0.6080320	0.6010798	2120	0.7154117	0.7202116	1607	0.3103671	0.3124492	451
15	–0.5940817	–0.5870383	–2154	–0.7249558	–0.7296442	+1577	–0.3145071	–0.3165408	+ 434

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.5799502	−0.5728178	−2187	−0.7342764	−0.7388520	+1547	−0.3185502	−0.3205351	+ 416
17	0.5656418	0.5584227	2220	0.7433707	0.7478321	1517	0.3224955	0.3244310	398
18	0.5511611	0.5438575	2252	0.7522358	0.7565817	1486	0.3263415	0.3282269	380
19	0.5365127	0.5291271	2284	0.7608694	0.7650986	1454	0.3300870	0.3319217	362
20	0.5217011	0.5142355	2315	0.7692689	0.7733801	1421	0.3337310	0.3355147	344
21	−0.5067308	−0.4991876	−2346	−0.7774319	−0.7814239	+1388	−0.3372728	−0.3390046	+ 326
22	0.4916065	0.4839879	2376	0.7853559	0.7892277	1354	0.3407108	0.3423908	307
23	0.4763324	0.4686406	2406	0.7930390	0.7967894	1321	0.3440445	0.3456719	289
24	0.4609132	0.4531502	2435	0.8004789	0.8041073	1286	0.3472728	0.3488473	270
25	0.4453528	0.4375213	2463	0.8076742	0.8111791	1250	0.3503951	0.3519158	251
26	−0.4296562	−0.4217580	−2490	−0.8146217	−0.8180019	+1214	−0.3534095	−0.3548761	+ 232
27	0.4138274	0.4058649	2517	0.8213193	0.8245737	1177	0.3563155	0.3577275	213
28	0.3978711	0.3898466	2543	0.8277648	0.8308924	1139	0.3591120	0.3604689	193
29	0.3817919	0.3737076	2569	0.8339563	0.8369563	1101	0.3617982	0.3630997	173
30	0.3655939	0.3574517	2595	0.8398920	0.8427631	1062	0.3643733	0 3656188	153
Dec. 1	−0.3492815	−0.3410841	−2619	−0.8455695	−0.8483108	+1023	−0.3668362	−0.3680253	+ 133
2	0.3328600	0.3246098	2643	0.8509866	0.8535969	984	0.3691861	0.3703184	113
3	0.3163342	0.3080338	2666	0.8561413	0.8586196	945	0.3714221	0.3724970	93
4	0.2997091	0.2913608	2688	0.8610315	0.8633768	904	0.3735431	0.3745602	73
5	0.2829895	0.2745960	2711	0 8656552	0.8678666	863	0.3755482	0.3765072	52
6	−0.2661808	−0.2577446	−2733	−0.8700107	−0.8720872	+ 822	−0.3774371	−0.3783376	+ 31
7	0.2492883	0.2408124	2753	0.8740959	0.8760367	780	0.3792087	0.3800502	+ 11
8	0.2323175	0.2238043	2773	0.8779094	0.8797138	737	0.3808621	0.3816445	− 10
9	0.2152736	0.2067261	2792	0.8814498	0.8831172	694	0.3823972	0.3831202	31
10	0.1981624	0.1895833	2810	0.8847158	0.8862454	651	0.3838133	0.3844765	52
11	−0.1809894	−0.1723814	−2828	−0.8877059	−0.8890970	+ 607	−0.3851098	−0.3857130	− 73
12	0.1637602	0.1551264	2845	0.8904187	0.8916711	564	0.3862862	0.3868293	94
13	0.1464807	0.1378239	2860	0.8928538	0.8939669	519	0.3873423	0.3878251	115
14	0.1291567	0.1204798	2875	0.8950104	0.8959841	474	0.3882776	0.3887000	136
15	0.1117938	0.1030993	2889	0.8968879	0.8977219	428	0.3890922	0.3894540	157
16	−0.0943973	−0.0856881	−2902	−0.8984859	−0.8991800	+ 382	−0.3897856	−0.3900870	− 178
17	0.0769729	0.0682520	2915	0.8998042	0.9003585	336	0.3903580	0.3905986	199
18	0.0595262	0.0507962	2926	0.9008429	0.9012573	289	0.3908088	0.3909888	220
19	0.0420627	0.0333264	2936	0.9016018	0.9018763	242	0.3911385	0.3912579	241
20	0.0245880	−0.0158481	2946	0.9020807	0.9022153	194	0.3913470	0.3914057	262
21	−0.0071073	+0.0016340	−2955	−0.9022799	−0.9022746	+ 146	−0.3914340	−0.3914320	− 283
22	+0.0103752	0.0191155	2964	0.9021993	0.9020543	98	0.3913997	0.3913371	304
23	0.0278540	0.0365901	2970	0.9018396	0.9015552	+ 49	0.3912443	0.3911211	325
24	0.0453232	0.0540526	2976	0.9012010	0.9007772	0	0.3909677	0.3907840	346
25	0.0627777	0.0714979	2981	0.9002835	0.8997202	− 49	0.3905701	0.3903258	367
26	0.0802127	0.0889215	2985	0.8990872	0.8983846	97	0.3900514	0.3897466	389
27	+0.0976238	+0.1063187	−2989	−0.8976123	−0.8967708	− 147	−0.3894116	−0.3890464	− 410
28	0.1150056	0.1236838	2991	0.8958594	0.8948789	197	0.3886511	0.3882258	431
29	0.1323529	0.1410120	2992	0.8938288	0.8927093	247	0.3877702	0.3872844	452
30	0.1496604	0.1582976	2992	0.8915206	0.8902626	297	0.3867684	0.3862224	473
31	0.1669228	0.1755354	2991	0.8889354	0.8875390	347	0.3856465	0.3850405	494
32	+0.1841347	+0.1927200	−2990	−0.8860735	−0.8845390	− 398	−0.3844045	−0.3837384	− 515

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		FEBRUARY.		MARCH.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	67° 27′ 11″.7	+0° 7′ 35″.0	113° 29′ 6″.0	−3° 39′ 54″.5	122° 28′ 0″.3	−4° 16′ 19″.5
1.5	73 44 32.5	−0 26 47.5	119 28 15.2	4 0 20.9	128 24 24.5	4 31 6.7
2.0	79 59 12.4	1 0 33.8	125 26 30.0	4 18 3.5	134 20 22.9	4 42 55.3
2.5	86 11 22.3	1 33 21.0	131 24 0.9	4 32 52.6	140 16 12.6	4 51 38.8
3.0	92 21 11.9	2 4 47.6	137 20 57.7	4 44 40.3	146 12 8.1	4 57 12.2
3.5	98 28 50.2	−2 34 33.9	143 17 29.6	−4 53 20.3	152 8 21.8	−4 59 31.8
4.0	104 34 25.8	3 2 21.7	149 13 46.4	4 58 48.1	158 5 4.3	4 58 35.5
4.5	110 38 7.1	3 27 54.6	155 9 57.7	5 1 0.8	164 2 25.3	4 54 22.9
5.0	116 40 3.1	3 50 58.3	161 6 14.8	4 59 57.0	170 0 33.9	4 46 55.4
5.5	122 40 23.3	4 11 20.4	167 2 50.4	4 55 37.2	175 59 38.8	4 36 16.1
6.0	128 39 18.4	−4 28 50.5	172 59 59.0	−4 48 3.4	181 59 48.9	−4 22 29.8
6.5	134 37 1.2	4 43 19.9	178 57 57.6	4 37 18.9	188 1 14.3	4 5 43.4
7.0	140 33 45.5	4 54 41.8	184 57 5.6	4 23 28.7	194 4 6.3	3 46 5.2
7.5	146 29 47.8	5 2 51.2	190 57 44.9	4 6 38.8	200 8 37.9	3 23 45.6
8.0	152 25 26.7	5 7 44.5	197 0 20.3	3 46 56.7	206 15 4.3	2 58 56.4
8.5	158 21 3.3	−5 9 19.4	203 5 19.4	−3 24 31.1	212 23 43.0	−2 31 51.2
9.0	164 17 1.1	5 7 34.9	209 13 12.0	2 59 32.3	218 34 53 6	2 2 45.1
9.5	170 13 46.3	5 2 31.2	215 24 29.9	2 32 12.1	224 48 58.2	1 31 54.9
10.0	176 11 47.4	4 54 9.5	221 39 46.7	2 2 43.9	231 6 21.2	0 59 39.2
10.5	182 11 35.2	4 42 32.1	227 59 37.1	1 31 23.2	237 27 28.6	−0 26 18.0
11.0	188 13 42.6	−4 27 42.2	234 24 35.6	−0 58 27.6	243 52 47.3	+0 7 46.8
11.5	194 18 44.0	4 9 44.3	240 55 16.0	−0 24 17.5	250 22 45.2	0 42 11.3
12.0	200 27 15.2	3 48 44.1	247 32 9.9	+0 10 44.2	256 57 49.5	1 16 29.8
12.5	206 39 52.4	3 24 48.8	254 15 45.1	0 46 11.2	263 38 25.6	1 50 14.6
13.0	212 57 11.6	2 58 7.6	261 6 23.8	1 21 34.0	270 24 56.3	2 22 56.2
13.5	219 19 47.8	−2 28 52.2	268 4 20.4	+1 56 19.6	277 17 39.4	+2 54 3.1
14.0	225 48 13.9	1 57 16.6	275 9 39.9	2 29 52.5	284 16 46.5	3 23 2.5
14.5	232 22 59.4	1 23 38.3	282 22 15.4	3 1 34.5	291 22 20.9	3 49 20.8
15.0	239 4 28.8	0 48 18.5	289 41 46.3	3 30 45.7	298 34 15.4	4 12 24.6
15.5	245 53 0.3	−0 11 42.5	297 7 37.8	3 56 46.8	305 52 11.3	4 31 41.5
16.0	252 48 44.0	+0 25 40.2	304 39 0.5	+4 18 59.7	313 15 37.0	+4 46 41.4
16.5	259 51 40.3	1 3 15.5	312 14 51.0	4 36 50.5	320 43 47.9	4 56 58.6
17.0	267 1 37.9	1 40 25.6	319 53 53.4	4 49 50.7	328 15 47.0	5 2 13.0
17.5	274 18 13.4	2 16 29.4	327 34 43.0	4 57 39.7	335 50 26.6	5 2 11.9
18.0	281 40 50.6	2 50 43.8	335 15 49.9	5 0 5.9	343 26 30.6	4 56 51.0
18.5	289 8 40.1	+3 22 24.6	342 55 42.8	+4 57 7.2	351 2 37.7	+4 46 14.9
19.0	296 40 41.1	3 50 49.7	350 32 54.0	4 48 51.2	358 37 25.3	4 30 37.6
19.5	304 15 42.2	4 15 20.4	358 6 2.8	4 35 34.9	6 9 33.9	4 10 21.1
20.0	311 52 25.3	4 35 23.6	5 33 59.7	4 17 42.7	13 37 49.6	3 45 55.0
20.5	319 29 28.3	4 50 33.2	12 55 48.3	3 55 44.5	21 1 7 9	3 17 54.4
21.0	327 5 28.3	+5 0 32.0	20 10 46.6	+3 30 15.2	28 18 35.6	+2 46 57.8
21.5	334 39 6.7	5 5 11.9	27 18 27.7	3 1 50.7	35 29 32.2	2 13 45.6
22.0	342 9 11.6	5 4 33.7	34 18 38.5	2 31 7.8	42 33 30.5	1 38 58.2
22.5	349 34 40.9	4 58 46.8	41 11 18.6	1 58 42.5	49 30 15 9	1 3 14.1
23.0	356 54 44.3	4 48 7.8	47 56 38.7	1 25 8.9	56 19 45.7	+0 27 9.6
23.5	4 8 44.6	+4 32 59.1	54 34 58.5	+0 50 58.5	63 2 7.6	−0 8 42.4
24.0	11 16 17.5	4 13 47.3	61 6 44.0	+0 16 40.4	69 37 38.0	0 43 52.7
24.5	18 17 11.3	3 51 1.8	67 32 26.5	−0 17 19.3	76 6 40.5	1 17 55.6
25.0	25 11 25.0	3 25 13.2	73 52 40.5	0 50 37.1	82 29 44.1	1 50 29.1
25.5	31 59 7.0	2 56 52.6	80 8 1.9	1 22 51.8	88 47 21.7	2 21 14.1
26.0	38 40 33.7	+2 26 30.7	86 19 7.6	−1 53 44.6	95 0 8.8	−2 49 54 6
26.5	45 16 6.7	1 54 37.2	92 26 33.7	2 22 58.6	101 8 42.7	3 16 16.7
27.0	51 46 12.0	1 21 40.3	98 30 55.2	2 50 18.4	107 13 40.8	3 40 8.9
27.5	58 11 17.9	0 48 6.7	104 32 45.2	3 15 30.3	113 15 40.1	4 1 21.1
28.0	64 31 53.8	+0 14 21.8	110 32 34.4	3 38 21.8	119 15 17.0	4 19 44.7
28.5	70 48 29.3	−0 19 10.7	116 30 51.1	3 58 41.5	125 13 6.1	4 35 12.2
29.0	77 1 33.5	−0 52 8.6	122 28 0.3	−4 16 19.5	131 9 39.8	−4 47 37.3
29.5	83 11 33.8	1 24 11.0	128 24 24.5	4 31 6.7	137 5 28.3	4 56 54.8
30.0	89 18 55.5	1 54 58.5	134 20 22.9	4 42 55.3	143 0 59.6	5 3 0.1
30.5	95 24 2.0	2 24 12.8	140 16 12.6	4 51 38.8	148 56 38.3	5 5 50.0
31.0	101 27 14.2	2 51 37.0	146 12 8.1	4 57 12.2	154 52 46.7	5 5 22.1
31.5	107 28 50.3	−3 16 55.6	152 8 21.8	−4 59 31.8	160 49 44.3	−5 1 35.4

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		MAY.		JUNE.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	166° 47′ 48″.2	−4° 54′ 30″.7	199° 29′ 56″.0	−3° 23′ 43″.5	246° 23′ 33″.5	+0° 36′ 39″.5
1.5	172 47 13.0	4 44 9.7	205 42 4.6	2 56 35.2	253 6 49.2	1 13 15.0
2.0	178 48 11.1	4 30 36.2	211 57 21.9	2 27 5.2	259 54 23.0	1 49 10.7
2.5	184 50 53.2	4 13 55.9	218 15 54.7	1 55 31.1	266 45 59.0	2 23 52.3
3.0	190 55 28.4	3 54 16.6	224 37 47.3	1 22 13.0	273 41 17.6	2 56 44.9
3.5	197 2 4.7	−3 31 48.0	231 3 2.4	−0 47 33.5	280 39 55.2	+3 27 14.5
4.0	203 10 49.4	3 6 42.2	237 31 40.7	−0 11 57.8	287 41 25.7	3 54 48.4
4.5	209 21 49.8	2 39 13.3	244 3 41.6	+0 24 6.9	294 45 21.4	4 18 57.2
5.0	215 35 13.3	2 9 37.7	250 39 3.3	1 0 11.7	301 51 12.7	4 39 13.8
5.5	221 51 7.9	1 38 13.7	257 17 43.3	1 35 46.5	308 58 30.3	4 55 15.7
6.0	228 9 42.7	−1 5 21.6	263 59 38.4	+2 10 20.3	316 6 45.1	+5 6 45.9
6.5	234 31 7.8	−0 31 23.5	270 44 44.5	2 43 22.0	323 15 29.0	5 13 31.8
7.0	240 55 34.7	+0 3 16.9	277 32 57.3	3 14 20.6	330 24 15.9	5 15 26.5
7.5	247 23 16.2	0 38 14 4	284 24 12.0	3 42 46.1	337 32 41.6	5 12 28.6
8.0	253 54 25.7	1 13 2.5	291 18 22.5	4 8 10.1	344 40 23.9	5 4 42.1
8.5	260 29 17.5	+1 47 13.5	298 15 21.6	+4 30 5.9	351 47 2.9	+4 52 16.1
9.0	267 8 5.8	2 20 19.1	305 15 1.0	4 48 9.8	358 52 20.9	4 35 24.6
9.5	273 51 4.4	2 51 50.1	312 17 10.4	5 2 1.1	5 56 2.3	4 14 26.0
10.0	280 38 25.0	3 21 17.0	319 21 37.4	5 11 22.6	12 57 53.3	3 49 42.5
10.5	287 30 17.2	3 48 10.4	326 28 7.3	5 16 1.6	19 57 41.3	3 21 39.9
11.0	294 26 47.2	+4 12 1.4	333 36 22.4	+5 15 49.8	26 55 14.9	+2 50 46.9
11.5	301 27 56.0	4 32 22.1	340 46 2.3	5 10 44.3	33 50 23.5	2 17 34.3
12.0	308 33 38.9	4 48 46.7	347 56 43.4	5 0 47.3	40 42 57.0	1 42 34.6
12.5	315 43 43.8	5 0 51.7	355 7 58.9	4 46 6.6	47 32 45.3	1 6 21.1
13.0	322 57 50.9	5 8 17.3	2 19 19.7	4 26 56.1	54 19 39.3	+0 29 27.5
13.5	330 15 32.1	+5 10 48.7	9 30 14.1	+4 3 34.8	61 3 29.7	−0 7 32.9
14.0	337 36 10.4	5 8 16.3	16 40 8.8	3 36 27.3	67 44 7.6	0 44 7.9
14.5	344 59 1.2	5 0 37.4	23 48 29.8	3 6 2.4	74 21 25.0	1 19 47.1
15.0	352 23 12.8	4 47 56.4	30 54 43.0	2 32 53.0	80 55 14.9	1 54 2.1
15.5	359 47 48.5	4 30 25.1	37 58 15.3	1 57 34.7	87 25 31.8	2 26 27.4
16.0	7 11 48.3	+4 8 22.8	44 58 35.5	+1 20 44.9	93 52 11.9	−2 56 40.3
16.5	14 34 11.5	3 42 16.0	51 55 15.7	0 43 1.5	100 15 13.9	3 24 21.3
17.0	21 53 59.4	3 12 36.5	58 47 51.5	+0 5 2.0	106 34 39.3	3 49 13.9
17.5	29 10 17.2	2 40 0.9	65 36 2.8	−0 32 37.9	112 50 32.4	4 11 5.6
18.0	36 22 16.0	2 5 8.6	72 19 34.6	1 9 24.9	119 3 0.9	4 29 45.8
18.5	43 29 15.0	+1 28 40.3	78 58 17.1	−1 44 48.6	125 12 15.5	−4 45 7.5
19.0	50 30 41.9	0 51 16.7	85 32 5.8	2 18 22.4	131 18 30.6	4 57 5.8
19.5	57 26 13.5	+0 13 36.4	92 1 2.1	2 49 43.5	137 22 3.9	5 5 38.3
20.0	64 15 36.2	−0 23 44.4	98 25 12.1	3 18 32.6	143 23 16.2	5 10 44.2
20.5	70 58 45.1	1 0 13.0	104 44 47.0	3 44 34.1	149 22 31.4	5 12 24.3
21.0	77 35 43.7	−1 35 20.6	111 0 2.8	−4 7 35.7	155 20 16.0	−5 10 40.9
21.5	84 6 42.8	2 8 42.5	117 11 19.2	4 27 28.1	161 16 59.1	5 5 37.2
22.0	90 31 59.7	2 39 57.7	123 18 59.7	4 44 4.5	167 13 12.1	4 57 17.2
22.5	96 51 57.1	3 8 48.9	129 23 31.0	4 57 20.2	173 9 28.2	4 45 45.7
23.0	103 7 1.8	3 35 2.0	135 25 22.2	5 7 12.4	179 6 22.0	4 31 8.5
23.5	109 17 43.9	−3 58 25.7	141 25 4.4	−5 13 39.6	185 4 29.3	−4 13 32.1
24.0	115 24 36.5	4 18 51.1	147 23 10.3	5 16 41.5	191 4 26.5	3 53 3.9
24.5	121 28 13.7	4 36 11.2	153 20 14.0	5 16 18.9	197 6 49.9	3 29 52.2
25.0	127 29 11.1	4 50 20.7	159 16 49.7	5 12 33.2	203 12 15.3	3 4 6.9
25.5	133 28 4.0	5 1 15.3	165 13 32.1	5 5 26.7	209 21 17.3	2 35 59.4
26.0	139 25 27.7	−5 8 52.0	171 10 55.5	−4 55 2.4	215 34 28.5	−2 5 43.2
26.5	145 21 56.8	5 13 8.7	177 9 33.7	4 41 24.4	221 52 19.2	1 33 34.1
27.0	151 18 4.5	5 14 4.1	183 9 58.9	4 24 37.7	228 15 15.8	0 59 50 4
27.5	157 14 22.4	5 11 37.7	189 12 42.1	4 4 48.5	234 43 40.5	−0 24 53.4
28.0	163 11 20.0	5 5 50.1	195 18 12.2	3 42 4.7	241 17 50 2	+0 10 52.5
28.5	169 9 25.2	4 56 42.8	201 26 55.8	3 16 35.9	247 57 55.5	0 46 59.4
29.0	175 9 3.1	−4 44 18.6	207 39 16.4	−2 48 33.8	254 43 59.7	+1 22 56.7
29.5	181 10 36.4	4 28 41.6	213 55 34.3	2 18 12.9	261 35 58.2	1 58 10.9
30.0	187 14 25.2	4 9 57.9	220 16 6.1	1 45 49.9	268 33 37.7	2 32 6.6
30.5	193 20 46.8	3 48 15.2	226 41 4.3	1 11 44.7	275 36 36.2	3 4 7.0
31.0	199 29 56.0	3 23 43.5	233 10 37.0	0 36 20.4	282 44 23.2	3 33 35.2
31.5	205 42 4.6	−2 56 35.2	239 44 47.2	−0 0 2.7	289 56 20.3	+3 59 56.0

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		AUGUST.		SEPTEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	282° 44′ 23″.2	+3° 33′ 35″.2	336° 3′ 49″.0	+4° 57′ 57″.0	29° 43′ 28″.7	+2° 2′ 47″.7
1.5	289 56 20.3	3 59 56.0	343 34 34.5	4 49 3.8	36 53 46.7	1 27 11.8
2.0	297 11 42.4	4 22 36.5	351 2 46.7	4 35 16.4	43 57 17.4	0 50 46.2
2 5	304 29 38.9	4 41 7.8	358 27 26.4	4 16 56.2	50 53 58.6	+0 14 8.2
3.0	311 49 16.5	4 55 6.6	5 47 45.5	3 54 30.1	57 43 57.9	−0 22 8.2
3.5	319 9 40.3	+5 4 15.9	13 3 6.9	+3 28 29.8	64 27 30.5	−0 57 32.8
4.0	326 29 56.7	5 8 25.5	20 13 5.1	2 59 29.0	71 4 57.5	1 31 38.8
4.5	333 49 15.3	5 7 32.1	27 17 25.7	2 28 3.0	77 36 44.5	2 4 2.8
5.0	341 6 50.5	5 1 39.6	34 16 3.7	1 54 47.4	84 3 19.1	2 34 24.9
5.5	348 22 2.9	4 50 58.3	41 9 3.0	1 20 16.8	90 25 10.4	3 2 27.9
6.0	355 34 20.1	+4 35 44.3	47 56 33.8	+0 45 4.2	96 42 47.6	−3 27 57.3
6.5	2 43 17.1	4 16 18.3	54 38 51.4	+0 9 41.1	102 56 39.5	3 50 41.0
7.0	9 48 36.2	3 53 5.0	61 16 14.4	−0 25 23.4	109 7 13.4	4 10 28.9
7.5	16 50 6.1	3 26 32.1	67 49 4.0	0 59 42.5	115 14 55.2	4 27 12.9
8.0	23 47 41.1	2 57 9.1	74 17 41.8	1 32 51.4	121 20 8.8	4 40 46.3
8.5	30 41 21.0	+2 25 27.2	80 42 29.1	−2 4 27.8	127 23 15.5	−4 51 4.7
9.0	37 31 9.1	1 51 57.7	87 3 47.1	2 34 11.6	133 24 34.8	4 58 4.7
9.5	44 17 11.7	1 17 12.3	93 21 55.5	3 1 44.6	139 24 24 0	5 1 44.6
10.0	50 59 36.2	0 41 42.3	99 37 11.8	3 26 51.0	145 22 58.3	5 2 4.7
10.5	57 38 31.7	+0 5 58.1	105 49 51.7	3 49 17.0	151 20 31.1	4 59 6.3
11.0	64 14 7.1	−0 29 31.2	112 0 9.2	−4 8 50.7	157 17 14.7	−4 52 52.5
11.5	70 46 30.8	1 4 17.6	118 8 16.2	4 25 22.3	163 13 20.5	4 43 28.2
12.0	77 15 50.6	1 37 55.0	124 14 22.7	4 38 44.2	169 8 59.3	4 30 59.6
12.5	83 42 13.0	2 9 59.1	130 18 37.8	4 48 50.9	175 4 22.4	4 15 34.7
13.0	90 5 43.5	2 40 7.6	136 21 9.6	4 55 38.9	180 59 40.9	3 57 22.7
13.5	96 26 26.4	−3 8 0.8	142 22 5.9	−4 59 6.4	186 55 7.2	−3 36 34.3
14.0	102 44 25.4	3 33 21.3	148 21 34.8	4 59 13.8	192 50 55.3	3 13 21.7
14.5	108 59 43·7	3 55 54.3	154 19 45.0	4 56 3.4	198 47 20.5	2 47 58.1
15.0	115 12 24.7	4 15 27.5	160 16 46.4	4 49 39.1	204 44 40.4	2 20 37.8
15.5	121 22 32.3	4 31 51.4	166 12 50.8	4 40 6.4	210 43 15.0	1 51 36.2
16.0	127 30 11.4	−4 44 58.9	172 8 12.1	−4 27 32.1	216 43 26.4	−1 21 9.8
16.5	133 35 29.0	4 54 45.3	178 3 6.3	4 12 4.5	222 45 39.6	0 49 36.0
17.0	139 38 33.7	5 1 8.3	183 57 52.2	3 53 53.0	228 50 21.9	−0 17 13.0
17.5	145 39 36.3	5 4 7.6	189 52 51.6	3 33 8.0	234 58 2.6	+0 15 39.9
18.0	151 38 50.6	5 3 44.7	195 48 29.0	3 10 0.6	241 9 13.0	0 48 42.1
18.5	157 36 33.2	−5 0 2.7	201 45 11.8	−2 44 43.1	247 24 25.8	+1 21 32.2
19.0	163 33 3.4	4 53 6.2	207 43 30.4	2 17 28.5	253 44 13.9	1 53 47.3
19.5	169 28 43.6	4 43 0.7	213 43 57.8	1 48 30.9	260 9 10.3	2 25 3.2
20.0	175 23 59.4	4 29 52.9	219 47 9·3	1 18 5.3	266 39 46.4	2 54 54.2
20.5	181 19 19.0	4 13 50.4	225 53 41.7	0 46 27.9	273 16 30.9	3 22 53.5
21.0	187 15 13.5	−3 55 1.7	232 4 13.0	−0 13 56.3	279 59 48.8	+3 48 33.0
21.5	193 12 16.3	3 33 35.8	238 19 21.6	+0 19 10.0	286 49 59.2	4 11 23.7
22.0	199 11 2.9	3 9 42.8	244 39 45.4	0 52 29.8	293 47 13.9	4 30 56.2
22.5	205 12 10.4	2 43 33.7	251 6 0.7	1 25 39.9	300 51 35.1	4 46 42.1
23.0	211 16 16.9	2 15 20.8	257 38 40.7	1 58 14.8	308 2 54.5	4 58 14.2
23.5	217 24 1.2	−1 45 17.5	264 18 13.9	+2 29 46.5	315 20 51.0	+5 5 8.1
24.0	223 36 1.7	1 13 39.1	271 5 3.0	2 59 44.9	322 44 50.7	5 7 4.1
24.5	229 52 55.7	0 40 43.2	277 59 22.2	3 27 37.9	330 14 6.6	5 3 48.3
25.0	236 15 18.0	−0 6 49.4	285 1 15.7	3 52 52.2	337 47 39.1	4 55 14.3
25.5	242 43 40.3	+0 27 39.9	292 10 36.0	4 14 54.0	345 24 18.0	4 41 24.3
26.0	249 18 29.8	+1 2 19.6	299 27 2.4	+4 33 10.1	353 2 45.5	+4 22 29.6
26.5	256 0 7.3	1 36 41.5	306 49 59.8	4 47 9.9	0 41 38.5	3 58 50.7
27.0	262 48 46.2	2 10 14.4	314 18 39.3	4 56 26.9	8 19 33.7	3 30 56.8
27.5	269 44 30.5	2 42 24.8	321 51 58.4	5 0 40.2	15 55 10.0	2 59 24.9
28.0	276 47 13.6	3 12 37.2	329 28 44.2	4 59 36.7	23 27 13.2	2 24 56.3
28.5	283 56 37.3	3 40 14.8	337 7 34.5	4 53 11.7	30 54 37.7	1 48 16.6
29.0	291 12 11 2	+4 4 41.4	344 47 3.1	+4 41 30.2	38 16 29.3	+1 10 12.0
29.5	298 33 12.5	4 25 22 7	352 25 43.2	4 24 46.7	45 32 6.2	+0 31 27.8
30.0	305 58 46.8	4 41 47.6	0 2 11.5	4 3 24.1	52 40 59.4	−0 7 13.1
30.5	313 27 50 5	4 53 30.4	7 35 11.6	3 37 53.1	59 42 52.6	0 45 11.6
31.0	320 59 12.3	5 0 12.2	15 3 37.9	3 8 49.8	66 37 40.6	1 21 53.6
31.5	328 31 37.1	+5 1 41.8	22 26 36.9	+2 36 54.2	73 25 28.2	−1 56 49.4

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		NOVEMBER.		DECEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	66° 37′ 40″.6	–1° 21′ 53″.6	114° 16′ 23″.8	–4° 44′ 14″.7	146° 53′ 41″.8	–5° 13′ 51″.6
1.5	73 25 28.2	1 56 49.4	120 32 0.7	4 57 50.6	152 55 39.2	5 8 23.5
2.0	80 6 29.1	2 29 34.4	126 43 7.1	5 7 48.1	158 55 0.9	4 59 35.6
2.5	86 41 3.3	2 59 48.5	132 50 15.8	5 14 8.4	164 52 22.7	4 47 36.6
3.0	93 9 35.9	3 27 15.5	138 54 0.7	5 16 54.4	170 48 21.6	4 32 35.5
3.5	99 32 35.8	–3 51 43.1	144 54 56.3	–5 16 10.0	176 43 34.5	–4 14 41.9
4.0	105 50 34.1	4 13 1.8	150 53 36.7	5 11 59.7	182 38 38.4	3 54 5.9
4.5	112 4 3.0	4 31 4.6	156 50 35.6	5 4 29.3	188 34 9.5	3 30 58.2
5.0	118 13 35.5	4 45 46.7	162 46 25.6	4 53 44.9	194 30 43.0	3 5 30.3
5.5	124 19 43.7	4 57 5.0	168 41 38.0	4 39 53.6	200 28 52.2	2 37 55.1
6.0	130 22 58.8	–5 4 58.1	174 36 42.4	–4 23 3.4	206 29 8.5	–2 8 26.4
6.5	136 23 50.8	5 9 25.8	180 32 6.6	4 3 23.3	212 32 1.0	1 37 19.6
7.0	142 22 48.2	5 10 29.0	186 28 16.1	3 41 3.4	218 37 55.5	1 4 52.0
7.5	148 20 17.3	5 8 9.7	192 25 34.4	3 16 15.2	224 47 14.5	–0 31 22.4
8.0	154 16 42.4	5 2 31.2	198 24 22.7	2 49 11.6	231 0 17.0	+0 2 48.1
8.5	160 12 25.6	–4 53 38.1	204 25 0.0	–2 20 7.0	237 17 17.8	+0 37 16.4
9.0	166 7 47.2	4 41 36.1	210 27 42.9	1 49 17.7	243 38 27.6	1 11 37.6
9.5	172 3 5.5	4 26 32.1	216 32 45.7	1 17 1.7	250 3 52.4	1 45 25.1
10.0	177 58 36.9	4 8 34.6	222 40 20.7	0 43 38.8	256 33 33.5	2 18 11.2
10.5	183 54 36.6	3 47 53.5	228 50 38.3	–0 9 30.2	263 7 28.0	2 49 26.9
11.0	189 51 18.3	–3 24 40.2	235 3 47.5	+0 25 1.1	269 45 28.4	+3 18 43.2
11.5	195 48 54.9	2 59 7.7	241 19 55.6	0 59 30.7	276 27 23.3	3 45 31.4
12.0	201 47 39.0	2 31 30.4	247 39 8.7	1 33 33.4	283 12 57.9	4 9 24.0
12.5	207 47 42.8	2 2 4.2	254 1 32.0	2 6 43.1	290 1 54.5	4 29 55.5
13.0	213 49 18.8	1 31 6.5	260 27 10.2	2 38 33.2	296 53 53.3	4 46 42.8
13.5	219 52 40.0	–0 58 56.0	266 56 7.4	+3 8 37.3	303 48 33.1	+4 59 26.3
14.0	225 58 0.4	–0 25 52.6	273 28 27.2	3 36 29.1	310 45 32.2	5 7 50.1
14.5	232 5 35.2	+0 7 42.9	280 4 12.8	4 1 43.1	317 44 29.2	5 11 42.7
15.0	238 15 40.9	0 41 28.6	286 43 27.3	4 23 55.1	324 45 3.5	5 10 57.4
15.5	244 28 35.3	1 15 1.7	293 26 12.8	4 42 42.4	331 46 55.7	5 5 32.1
16.0	250 44 37.7	+1 47 58.7	300 12 30.9	+4 57 44.1	338 49 48.1	+4 55 29.4
16.5	257 4 8.3	2 19 55.7	307 2 22.1	5 8 41.6	345 53 24.7	4 40 57.2
17.0	263 27 28.1	2 50 28.2	313 55 45.5	5 15 19.4	352 57 31.2	4 22 7.7
17.5	269 54 58.8	3 19 11.2	320 52 38.2	5 17 25.2	0 1 54.7	3 59 17.7
18.0	276 27 1.1	3 45 39.5	327 52 54.8	5 14 50.2	7 6 23.1	3 32 48.0
18.5	283 3 54.6	+4 9 27.9	334 56 27.0	+5 7 30.2	14 10 45.1	+3 3 3.6
19.0	289 45 57.2	4 30 11.4	342 3 2.9	4 55 25.4	21 14 49.3	2 30 32.7
19.5	296 33 23.5	4 47 25.5	349 12 26.5	4 38 41.3	28 18 23.6	1 55 46.6
20.0	303 26 23.6	5 0 47.1	356 24 17.6	4 17 28.9	35 21 14.9	1 19 18.9
20.5	310 25 2.0	5 9 54.7	3 38 11.3	3 52 5.2	42 23 8.7	0 41 45.2
21.0	317 29 16.8	+5 14 29.5	10 53 38.2	+3 22 52.6	49 23 48.7	+0 3 41.8
21.5	324 38 57.9	5 14 16.2	18 10 4.5	2 50 19.3	56 22 56.6	–0 34 14.5
22.0	331 53 46.1	5 9 4.1	25 26 52.5	2 14 58.6	63 20 12.5	1 11 27.4
22.5	339 13 13.1	4 58 48.2	32 43 21.7	1 37 28.1	70 15 15.2	1 47 22.4
23.0	346 36 40.8	4 43 30.1	39 58 49.5	0 58 28.4	77 7 42.4	2 21 27.2
23.5	354 3 22.2	+4 23 19.0	47 12 32.5	+0 18 42.1	83 57 11.6	–2 53 12.5
24.0	1 32 22.3	3 58 31.8	54 23 47.6	–0 21 7.9	90 43 21.4	3 22 12.7
24.5	9 2 40.0	3 29 33.4	61 31 53.9	1 0 19.7	97 25 52.0	3 48 6.4
25.0	16 33 9.8	2 56 56.1	68 36 13.4	1 38 13.6	104 4 26.1	4 10 36.7
25.5	24 2 44.6	2 21 18.3	75 36 12.6	2 14 13.9	110 38 49.9	4 29 31.0
26.0	31 30 18.5	+1 43 23.2	82 31 23.4	–2 47 49.3	117 8 54.0	–4 44 41.1
26.5	38 54 49.2	1 3 56.8	89 21 23.7	3 18 33.3	123 34 33.5	4 56 2.8
27.0	46 15 19.9	+0 23 46.2	96 5 58.6	3 46 5.0	129 55 48.6	5 3 35.3
27.5	53 31 1.4	–0 16 22.9	102 45 0.0	4 10 8.5	136 12 45.0	5 7 21.3
28.0	60 41 13.2	0 55 47.3	109 18 26.6	4 30 32.8	142 25 33.4	5 7 25.8
28.5	67 45 24.7	1 33 48.0	115 46 24.0	4 47 11.2	148 34 29.3	5 3 55.7
29.0	74 43 15.1	–2 9 50.8	122 9 3.9	–5 0 0.9	154 39 52.9	–4 56 59.9
29.5	81 34 33.2	2 43 27.1	128 26 43.6	5 9 2.1	160 42 9.0	4 46 48.0
30.0	88 19 17.4	3 14 13.9	134 39 45.0	5 14 17.6	166 41 45.7	4 33 30.7
30.5	94 57 34.1	3 41 53.3	140 48 34.5	5 15 52.1	172 39 14.7	4 17 19.1
31.0	101 29 36.9	4 6 12.0	146 53 41.8	5 13 51.6	178 35 10.4	3 58 24.8
31.5	107 55 45.3	–4 27 1.0	152 55 39.2	–5 8 23.5	184 30 9.7	–3 36 59·7

FOR GREENWICH MEAN NOON.

Date.	MOON'S EQUATOR. i Inclination to Earth's Equator.	MOON'S EQUATOR. Δ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	MOON'S EQUATOR. ☊′ Ascend'g Node on Earth's Equator.	☾ Mean Longitude of the Moon.
	° ′	° ′	° ′	° ′
Jan. 0	24 3.9	64 6.1	3 20.8	48 48.4
10	24 4.6	63 35.1	3 19.9	180 34.2
20	24 5.3	63 4.2	3 19.0	312 20.1
30	24 6.1	62 33.3	3 18.1	84 5.9
Feb. 9	24 6.8	62 2.4	3 17.2	215 51.7
19	24 7.5	61 31.5	3 16.2	347 37.6
March 1	24 8.3	61 0.6	3 15.2	119 23.4
11	24 9.0	60 29.8	3 14.2	251 9.3
21	24 9.7	59 58.9	3 13.2	22 55.1
31	24 10.4	59 28.1	3 12.2	154 40.9
April 10	24 11.1	58 57.2	3 11.2	286 26.8
20	24 11.8	58 26.4	3 10.2	58 12.6
30	24 12.5	57 55.6	3 9.1	189 58.4
May 10	24 13.1	57 24.9	3 8.0	321 44.3
20	24 13.8	56 54.1	3 6.9	93 30.1
30	24 14.5	56 23.3	3 5.9	225 16.0
June 9	24 15.1	55 52.6	3 4.8	357 1.8
19	24 15.8	55 21.9	3 3.6	128 47.6
29	24 16.5	54 51.2	3 2.5	260 33.5
July 9	24 17.2	54 20.5	3 1.3	32 19.3
19	24 17.9	53 49.7	3 0.2	164 5.1
29	24 18.5	53 19.0	2 59.0	295 51.0
Aug. 8	24 19.2	52 48.4	2 57.8	67 36.8
18	24 19.8	52 17.7	2 56.6	199 22.7
28	24 20.5	51 47.1	2 55.3	331 8.5
Sept. 7	24 21.1	51 16.4	2 54.1	102 54.3
17	24 21.7	50 45.8	2 52.8	234 40.2
27	24 22.4	50 15.2	2 51.5	6 26.0
Oct. 7	24 23.0	49 44.6	2 50.2	138 11.8
17	24 23.7	49 14.0	2 49.0	269 57.7
27	24 24.3	48 43.4	2 47.7	41 43.5
Nov. 6	24 24.9	48 12.9	2 46.4	173 29.3
16	24 25.5	47 42.3	2 45.0	305 15.2
26	24 26.0	47 11.8	2 43.7	77 1.0
Dec. 6	24 26.6	46 41.2	2 42.4	208 46.9
16	24 27.2	46 10.7	2 41.0	340 32.7
26	24 27.8	45 40.1	2 39.6	112 18.5
36	24 28.3	45 9.6	2 38.2	244 4.4

Mean Solar Days.	Motion of ☾.
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52 94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

TABLE FOR THE LIBRATION OF THE MOON.

Argument, (☊—λ) or (☊—λ—180°).

☊ − λ	Δλ	$\frac{1}{a}$	*B*		☊ − λ	Δλ	$\frac{1}{a}$	*B*	
0°	0'.0	39	0° 0'.0	180°	46°	0'.6	56	1° 3'.9	134°
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					
	Δλ	$\frac{1}{a}$	*B*	☊ − λ		Δλ	$\frac{1}{a}$	*B*	☊ − λ

Δλ has the sign of tan (λ — ☊)
a has the sign of cos (☊ — λ)
B has the sign of sin (☊ — λ)

FOR GREENWICH MEAN NOON.

Date.	Apparent Obliquity of the Ecliptic. (HANSEN.)	Equation of Equinoxes. In Longitude	Equation of Equinoxes. In R. A.	Precession of Equinoxes in Longitude.	The Sun's Aberration.	The Sun's Hor. Par.	Mean Longitude of Moon's Ascending Node.
Jan. 0	23° 27′ 12″.43	+16″.55	+1ˢ.012	0″.00	−20″.80	9″.00	247° 18′.0
10	12.43	16.88	1.032	1.38	20.79	9.00	246 46.3
20	12.48	17.10	1.046	2.75	20.77	8.99	246 14.5
30	12.57	17.18	1.051	4.13	20.74	8.98	245 42.7
Feb. 9	12.67	17.12	1.047	5.50	20.71	8.96	245 10.9
19	23 27 12.75	+16.88	+1.032	6.88	−20.67	8.94	244 39.2
March 1	12.80	16.52	1.010	8.26	20.63	8.92	244 7.4
11	12.80	16.07	0.983	9.63	20.57	8.90	243 35.6
21	12.73	15.58	0.953	11.01	20.51	8.87	243 3.8
31	12.59	15.09	0.923	12.38	20.45	8.85	242 32.1
April 10	23 27 12.40	+14.66	+0.897	13.76	−20.39	8.82	242 0.3
20	12.17	14.33	0.876	15.14	20.34	8.80	241 28.5
30	11.93	14.10	0.862	16.51	20.29	8.78	240 56.8
May 10	11.66	14.02	0.857	17.89	20.24	8.76	240 25.0
20	11.40	14.08	0.861	19.26	20.19	8.74	239 53.2
30	23 27 11.16	+14.26	+0.872	20.64	−20.16	8.72	239 21.4
June 9	10.98	14.52	0.888	22.02	20.13	8.71	238 49.7
19	10.85	14.84	0.908	23.39	20.11	8.71	238 17.9
29	10.78	15.16	0.927	24.77	20.11	8.70	237 46.1
July 9	10.77	15.45	0.945	26.14	20.10	8.70	237 14.3
19	23 27 10.80	+15.67	+0.958	27.52	−20.12	8.71	236 42.6
29	10.87	15.76	0.964	28.90	20.14	8.72	236 10.8
Aug. 8	10.97	15.72	0.961	30.27	20.17	8.73	235 39.0
18	11.06	15.55	0.951	31.65	20.20	8.75	235 7.3
28	11.13	15.26	0.933	33.02	20.24	8.77	234 35.5
Sept. 7	23 27 11.17	+14.85	+0.908	34.40	−20.29	8.79	234 3.7
17	11.14	14.37	0.879	35.78	20.35	8.81	233 31.9
27	11.05	13.84	0.846	37.15	20.41	8.84	233 0.2
Oct. 7	10.91	13.34	0.816	38.53	20.47	8.87	232 28.4
17	10.72	12.90	0.789	39.90	20.53	8.88	231 56.6
27	23 27 10.48	+12.57	+0.769	41.28	−20.59	8.91	231 24.9
Nov. 6	10.22	12.38	0.757	42.66	20.64	8.93	230 53.1
16	9.96	12.36	0.756	44.03	20.69	8.95	230 21.3
26	9.71	12.47	0.763	45.41	20.73	8.97	229 49.5
Dec. 6	9.49	12.68	0.775	46.78	20.76	8.98	229 17.8
16	23 27 9.35	+12.98	+0.794	48.16	−20.78	8.99	228 46.0
26	9.27	13.32	0.815	49.54	20.79	9.00	228 14.2
36	9.26	+13.64	+0.834	50.91	−20.79	9.00	227 42.4

Mean Obliquity, 1882.0, 23° 27′ 16″.44 (HANSEN).
Mean Obliquity, 1882.0, 23° 27′ 16″.12 (PETERS).

Precession for 1882.5	50″.2594	log 1.70122
Precession in a Solar Day	0″.1376	log 9.13863
Precession in a Sidereal Day	0″.1372	log 9.13744
Sun's Mean Equatorial Horizontal Parallax	8″.848	log 0.94685

Daily Motion of ☊,
−3′.177

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF PETERS AND STRUVE.

NOTATION.

τ, the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1881, December $30^d.742$ = 1882, January $0^d.0$ — $0^d.258$, Washington mean time),

α_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the sun's true longitude,

☊, the longitude of the moon's ascending node,

ω, the obliquity of the ecliptic,

Γ, the longitude of the sun's perigee,

Γ', the longitude of the moon's perigee,

☾, the moon's mean longitude.

BESSELIAN STAR NUMBERS.

$$\begin{aligned}
A = \tau &- 0.34246 \sin \text{☊} && - 0.00011 \sin (3 \odot - \Gamma) \\
&+ 0.00410 \sin 2 \text{☊} && - 0.00005 \sin 2 (\odot - \text{☊}) \\
&- 0.02519 \sin 2 \odot && + 0.00010 \sin 2 (\odot - \Gamma') \\
&+ 0.00293 \sin (\odot + 82^\circ\ 10') && + 0.00009 \sin (2\Gamma' - \text{☊}) \\
&+ 0.00025 \sin (2 \odot - \text{☊}) && + 0.00005 \cos \Gamma' \\
&- 0.00405 \sin 2 \text{☾} && + 0.00004 \sin 2 \Gamma' \\
&+ 0.00135 \sin (\text{☾} - \Gamma')
\end{aligned}$$

$$\begin{aligned}
B = &- 9''.2238 \cos \text{☊} && - 0''.0027 \cos (3 \odot - \Gamma) \\
&+ 0.0895 \cos 2 \text{☊} && + 0.0067 \cos (2 \odot - \text{☊}) \\
&- 0.5506 \cos 2 \odot && + 0.0024 \cos (2\Gamma' - \text{☊}) \\
&- 0.0092 \cos (\odot + 280^\circ\ 54') && - 0.0023 \sin \Gamma' \\
&- 0.0886 \cos 2 \text{☾} && + 0.0008 \cos 2 \Gamma'
\end{aligned}$$

$$\begin{aligned}
C &= - 20''.4451 \cos \omega \cos \odot \\
D &= - 20.4451 \sin \odot \\
E &= - \ 0.0462 \sin \text{☊} + 0''.0014 \sin 2 \text{☊} - 0''.0033 \sin 2 \odot
\end{aligned}$$

BESSEL'S *Star Constants.*

$a = 3^s.07238 + 1^s.33691 \sin \alpha_0 \tan \delta_0$ = precession in right ascension

$b = \frac{1}{15} \cos \alpha_0 \tan \delta_0$

$c = \frac{1}{15} \cos \alpha_0 \sec \delta_0$

$d = \frac{1}{15} \sin \alpha_0 \sec \delta_0$

$a' = 20''.0536 \cos \alpha_0$ = precession in declination

$b' = - \sin \alpha_0$

$c' = \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$

$d' = \cos \alpha_0 \sin \delta_0$

Reduction to Apparent Position.

$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + E$ (in time)

$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd'$ (in arc)

INDEPENDENT STAR NUMBERS.

$f = 46''.0857\ A + E$ (in arc) $= 3^s.07238\ A + \frac{1}{15} E$ (in time)

$g \sin G = B \qquad h \sin H = C$

$g \cos G = 20''.0536\ A \qquad h \cos H = D \qquad i = C \tan \omega$

Reduction to Apparent Position.

$\alpha = \alpha_0 + f + \tau\mu + \frac{1}{15} g \sin (G + \alpha) \tan \delta + \frac{1}{15} h \sin (H + \alpha) \sec \delta$ (in time)

$\delta = \delta_0 + \tau\mu' + g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta + i \cos \delta$ (in arc)

NOTES.—(1) When only one or two apparent positions of a star are required, or when BESSEL'S star constants are not known with sufficient accuracy, the independent star numbers are more convenient. Otherwise, the Besselian star numbers are more convenient.

(2) In using the star constants of the *British Association Catalogue*, a, b, c, d, a', b', c', d', must be changed to c, d, a, b, $-c'$, $-d'$, $-a'$, $-b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Jan. 1	+ 9.5216	+ 0.6132	− 0.5826	+ 1.3014	Feb. 16	+ 9.6745	+ 0.5593	− 1.2038	+ 1.0289
2	9.5282	0.6149	0.6182	1.2997	17	9.6763	0.5535	1.2084	1.0161
3	9.5347	0.6147	0.6509	1.2979	18	9.6774	0.5488	1.2128	1.0029
($7^{h}.0$) 4	9.5408	0.6125	0.6812	1.2959	($10^{h}.0$) 19	9.6780	0.5461	1.2170	0.9891
5	9.5461	0.6088	0.7094	1.2938	20	9.6786	0.5456	1.2211	0.9748
6	+ 9.5503	+ 0.6042	− 0.7357	+ 1.2915	21	+ 9.6793	+ 0.5474	− 1.2250	+ 0.9598
7	9.5534	0.5997	0.7604	1.2891	22	9.6805	0.5507	1.2287	0.9441
8	9.5556	0.5961	0.7837	1.2865	23	9.6823	0.5547	1.2323	0.9278
9	9.5573	0.5941	0.8056	1.2838	24	9.6848	0.5584	1.2356	0.9106
10	9.5588	0.5940	0.8263	1.2809	25	9.6878	0.5608	1.2389	0.8927
11	+ 9.5607	+ 0.5959	− 0.8459	+ 1.2779	26	+ 9.6910	+ 0.5613	− 1.2419	+ 0.8738
12	9.5634	0.5990	0.8646	1.2749	27	9.6942	0.5597	1.2448	0.8539
13	9.5671	0.6027	0.8824	1.2713	28	9.6970	0.5561	1.2476	0.8329
14	9.5717	0.6060	0.8993	1.2678	Mar. 1	9.6991	0.5511	1.2502	0.8108
15	9.5772	0.6081	0.9155	1.2641	2	9.7005	0.5457	1.2527	0.7874
16	+ 9.5831	+ 0.6084	− 0.9309	+ 1.2602	3	+ 9.7012	+ 0.5408	− 1.2550	+ 0.7625
17	9.5889	0.6066	0.9457	1.2562	4	9.7013	0.5375	1.2571	0.7359
18	9.5943	0.6031	0.9599	1.2520	5	9.7010	0.5363	1.2592	0.7074
19	9.5990	0.5981	0.9735	1.2476	($11^{h}.0$) 6	9.7009	0.5375	1.2611	0.6769
($8^{h}.0$) 20	9.6027	0.5926	0.9865	1.2431	7	9.7012	0.5409	1.2628	0.6439
21	+ 9.6054	+ 0.5875	− 0.9990	+ 1.2383	8	+ 9.7020	+ 0.5455	− 1.2644	+ 0.6080
22	9.6075	0.5836	1.0110	1.2334	9	9.7037	0.5505	1.2658	0.5689
23	9.6091	0.5816	1.0226	1.2284	10	9.7060	0.5547	1.2672	0.5257
24	9.6106	0.5816	1.0337	1.2229	11	9.7089	0.5575	1.2684	0.4776
25	9.6124	0.5834	1.0444	1.2174	12	9.7121	0.5582	1.2694	0.4234
26	+ 9.6149	+ 0.5864	− 1.0548	+ 1.2117	13	+ 9.7152	+ 0.5569	− 1.2703	+ 0.3615
27	9.6182	0.5897	1.0648	1.2057	14	9.7179	0.5538	1.2711	0.2889
28	9.6221	0.5923	1.0744	1.1995	15	9.7200	0.5494	1.2718	0.2016
29	9.6265	0.5934	1.0836	1.1931	16	9.7215	0.5452	1.2723	0.0922
30	9.6311	0.5926	1.0925	1.1865	17	9.7223	0.5418	1.2727	9.9456
31	+ 9.6354	+ 0.5897	− 1.1011	+ 1.1796	18	+ 9.7226	+ 0.5403	− 1.2730	+ 9.7227
Feb. 1	9.6392	0.5851	1.1094	1.1725	19	9.7227	0.5411	1.2731	+ 9.2405
2	9.6422	0.5793	1.1174	1.1651	20	9.7229	0.5441	1.2731	− 9.2553
3	9.6442	0.5733	1.1251	1.1575	($12^{h}.0$) 21	9.7235	0.5490	1.2730	9.7273
($9^{h}.0$) 4	9.9454	0.5681	1.1326	1.1496	22	9.7247	0.5549	1.2727	9.9479
5	+ 9.6461	+ 0.5645	− 1.1398	+ 1.1414	23	+ 9.7266	+ 0.5608	− 1.2723	− 0.0934
6	9.6466	0.5630	1.1468	1.1329	24	9.7290	0.5657	1.2718	0.2021
7	9.6472	0.5636	1.1534	1.1241	25	9.7317	0.5688	1.2711	0.2888
8	9.6483	0.5659	1.1599	1.1150	26	9.7344	0.5699	1.2703	0.3609
9	9.6502	0.5692	1.1661	1.1055	27	9.7369	0.5689	1.2694	0.4225
10	+ 9.6530	+ 0.5724	− 1.1721	+ 1.0957	28	+ 9.7389	+ 0.5665	− 1.2684	− 0.4763
11	9.6565	0.5747	1.1779	1.0856	29	9.7403	0.5633	1.2672	0.5241
12	9.6605	0.5753	1.1835	1.0751	30	9.7410	0.5604	1.2659	0.5670
13	9.6647	0.5738	1.1889	1.0642	31	9.7411	0.5587	1.2645	0.6059
14	9.6686	0.5703	1.1940	1.0529	32	9.7409	0.5590	1.2629	0.6414
15	+ 9.6719	+ 0.5652	− 1.1990	+ 1.0411	33	+ 9.7407	+ 0.5615	− 1.2612	− 0.6741
16	+ 9.6745	+ 0.5593	− 1.2038	+ 1.0289	34	+ 9.7408	+ 0.5662	− 1.2594	− 0.7044

E = + 0″.05

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
April 1	+ 9.7409	+ 0.5590	− 1.2629	− 0.6414	May 17	+ 9.8159	+ 0.6844	− 1.0077	− 1.2348
2	9.7407	0.5615	1.2612	0.6741	18	9.8187	0.6889	0.9962	1.2395
3	9.7408	0.5662	1.2594	0.7044	19	9.8218	0.6919	0.9843	1.2439
4	9.7414	0.5722	1.2574	0.7326	20	9.8248	0.6932	0.9719	1.2482
5	9.7427	0.5789	1.2553	0.7589	(16^{h}.0) 21	9.8275	0.6930	0.9591	1.2523
(13^{h}.0) 6	+ 9.7447	+ 0.5851	− 1.2530	− 0.7836	22	+ 9.8297	+ 0.6918	− 0.9457	− 1.2563
7	9.7473	0.5902	1.2506	0.8068	23	9.8314	0.6902	0.9317	1.2601
8	9.7502	0.5934	1.2481	0.8288	24	9.8326	0.6891	0.9172	1.2637
9	9.7532	0.5946	1.2454	0.8495	25	9.8334	0.6889	0.9021	1.2672
10	9.7559	0.5940	1.2426	0.8691	26	9.8340	0.6902	0.8863	1.2706
11	+ 9.7582	+ 0.5923	− 1.2397	− 0.8878	27	+ 9.8347	+ 0.6931	− 0.8697	− 1.2738
12	9.7599	0.5901	1.2366	0.9056	28	9.8357	0.6974	0.8524	1.2768
13	9.7610	0.5885	1.2333	0.9225	29	9.8372	0.7024	0.8343	1.2797
14	9.7616	0.5882	1.2299	0.9386	30	9.8392	0.7076	0.8152	1.2825
15	9.7620	0.5900	1.2264	0.9541	31	9.8418	0.7121	0.7952	1.2851
16	+ 9.7624	+ 0.5938	− 1.2227	− 0.9689	June 1	+ 9.8448	+ 0.7155	− 0.7740	− 1.2876
17	9.7631	0.5993	1.2188	0.9831	2	9.8480	0.7173	0.7517	1.2900
18	9.7643	0.6059	1.2148	0.9967	3	9.8511	0.7175	0.7280	1.2922
19	9.7660	0.6127	1.2106	1.0097	4	9.8540	0.7165	0.7028	1.2943
20	9.7684	0.6188	1.2062	1.0223	(17^{h}.0) 5	9.8564	0.7146	0.6760	1.2963
(14^{h}.0) 21	+ 9.7711	+ 0.6236	− 1.2017	− 1.0343	6	+ 9.8584	+ 0.7127	− 0.6473	− 1.2981
22	9.7739	0.6265	1.1970	1.0460	7	9.8599	0.7113	0.6164	1.2998
23	9.7767	0.6275	1.1922	1.0571	8	9.8610	0.7110	0.5830	1.3014
24	9.7791	0.6270	1.1871	1.0679	9	9.8621	0.7122	0.5468	1.3028
25	9.7809	0.6256	1.1819	1.0783	10	9.8632	0.7149	0.5070	1.3041
26	+ 9.7821	+ 0.6241	− 1.1765	− 1.0883	11	+ 9.8646	+ 0.7187	− 0.4631	− 1.3053
27	9.7828	0.6234	1.1708	1.0980	12	9.8664	0.7230	0.4143	1.3064
28	9.7831	0.6242	1.1650	1.1073	13	9.8687	0.7272	0.3592	1.3073
29	9.7832	0.6268	1.1590	1.1163	14	9.8714	0.7306	0.2959	1.3082
30	9.7836	0.6312	1.1528	1.1250	15	9.8743	0.7327	0.2214	1.3089
May 1	+ 9.7844	+ 0.6370	− 1.1464	− 1.1334	16	+ 9.8773	+ 0.7333	− 0.1315	− 1.3095
2	9.7858	0.6436	1.1397	1.1415	17	9.8801	0.7325	0.0178	1.3099
3	9.7879	0.6499	1.1329	1.1493	18	9.8824	0.7305	9.8633	1.3103
4	9.7905	0.6554	1.1258	1.1569	19	9.8843	0.7280	9.6212	1.3105
5	9.7935	0.6594	1.1184	1.1642	20	9.8857	0.7255	− 9.0170	1.3106
(15^{h}.0) 6	+ 9 7967	+ 0.6616	− 1.1108	− 1.1713	(18^{h}.0) 21	+ 9.8867	+ 0.7238	+ 9.3160	− 1.3106
7	9.7997	0.6621	1.1029	1.1781	22	9.8874	0.7234	9.7150	1.3104
8	9.8024	0.6614	1.0948	1.1847	23	9.8881	0.7244	9.9196	1.3102
9	9.8046	0.6601	1.0864	1.1911	24	9.8890	0.7268	0.0580	1.3098
10	9.8062	0.6589	1.0777	1.1973	25	9.8903	0.7301	0.1626	1.3093
11	+ 9.8073	+ 0.6587	− 1.0687	− 1.2032	26	+ 9.8920	+ 0.7337	+ 0.2467	− 1.3087
12	9.8082	0.6599	1.0595	1.2090	27	9.8942	0.7369	0.3171	1.3079
13	9.8091	0.6628	1.0498	1.2145	28	9.8969	0.7392	0.3777	1.3070
14	9.8101	0.6674	1.0399	1.2199	29	9.8997	0.7402	0.4305	1.3060
15	9.8115	0.6729	1.0296	1.2250	30	9.9026	0.7396	0.4776	1.3049
16	+ 9.8134	+ 0.6789	− 1.0188	− 1.2300	31	+ 9.9052	+ 0.7377	+ 0.5200	− 1.3037
17	+ 9.8159	+ 0.6844	− 1.0077	− 1.2348	32	+ 9.9075	+ 0.7348	+ 0.5585	− 1.3023

$E = +\ 0''.04$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
July 1	+ 9.9052	+ 0.7377	+ 0.5200	− 1.3037	Aug. 16	+ 9.9697	+ 0.6969	+ 1.1820	− 1.0782
2	9.9075	0.7348	0.5585	1.3023	17	9.9698	0.6971	1.1871	1.0679
3	9.9094	0.7316	0.5936	1.3008	18	9.9701	0.6987	1.1921	1.0572
4	9.9109	0.7287	0.6261	1.2992	19	9.9708	0.7011	1.1969	1.0462
5	9.9120	0.7268	0.6563	1.2975	20	9.9718	0.7037	1.2016	1.0347
($19^{h}.0$) 6	+ 9.9129	+ 0.7262	+ 0.6843	− 1.2957	($22^{h}.0$) 21	+ 9.9732	+ 0.7058	+ 1.2061	− 1.0228
7	9.9138	0.7270	0.7104	1.2937	22	9.9750	0.7068	1.2104	1.0104
8	9.9150	0.7291	0.7351	1.2916	23	9.9768	0.7063	1.2145	0.9975
9	9.9165	0.7319	0.7583	1.2893	24	9.9786	0.7042	1.2185	0.9841
10	9.9183	0.7349	0.7802	1.2867	25	9.9802	0.7009	1.2224	0.9701
11	+ 9.9205	+ 0.7373	+ 0.8009	− 1.2844	26	+ 9.9814	+ 0.6968	+ 1.2261	− 0.9555
12	9.9230	0.7386	0.8206	1.2817	27	9.9823	0.6927	1.2296	0.9403
13	9.9255	0.7385	0.8393	1.2789	28	9.9828	0.6892	1.2329	0.9242
14	9.9279	0.7368	0.8571	1.2760	29	9.9831	0.6871	1.2362	0.9076
15	9.9300	0.7340	0.8741	1.2729	30	9.9832	0.6865	1.2393	0.8903
16	+ 9.9317	+ 0.7303	+ 0.8904	− 1.2697	31	+ 9.9835	+ 0.6877	+ 1.2422	− 0.8721
17	9.9330	0.7266	0.9059	1.2663	Sept. 1	9.9840	0.6901	1.2450	0.8529
18	9.9338	0.7234	0.9208	1.2628	2	9.9848	0.6931	1.2477	0.8326
19	9.9344	0.7213	0.9351	1.2592	3	9.9859	0.6961	1.2502	0.8112
20	9.9348	0.7207	0.9488	1.2554	4	9.9873	0.6984	1.2526	0.7885
($20^{h}.0$) 21	+ 9.9353	+ 0.7215	+ 0.9620	− 1.2514	($23^{h}.0$) 5	+ 9.9889	+ 0.6993	+ 1.2548	− 0.7644
22	9.9361	0.7235	0.9747	1.2472	6	9.9905	0.6988	1.2569	0.7388
23	9.9373	0.7260	0.9869	1.2429	7	9.9919	0.6967	1.2589	0.7115
24	9.9390	0.7284	0.9987	1.2385	8	9.9931	0.6936	1.2608	0.6821
25	9.9410	0.7301	1.0100	1.2339	9	9.9938	0.6899	1.2625	0.6505
26	+ 9.9433	+ 0.7306	+ 1.0209	− 1.2291	10	+ 9.9942	+ 0.6865	+ 1.2641	− 0.6162
27	9.9457	0.7295	1.0315	1.2241	11	9.9943	0.6840	1.2655	0.5787
28	9.9479	0.7270	1.0417	1.2189	12	9.9941	0.6830	1.2669	0.5376
29	9.9498	0.7234	1.0515	1.2136	13	9.9940	0.6837	1.2681	0.4921
30	9.9514	0.7193	1.0610	1.2080	14	9.9939	0.6860	1.2691	0.4410
31	+ 9.9525	+ 0.7152	+ 1.0702	− 1.2023	15	+ 9.9942	+ 0.6893	+ 1.2701	− 0.3830
Aug. 1	9.9533	0.7120	1.0791	1.1964	16	9.9949	0.6931	1.2709	0.3158
2	9.9539	0.7101	1.0876	1.1903	17	9.9959	0.6966	1.2716	0.2361
3	9.9545	0.7097	1.0959	1.1839	18	9.9972	0.6991	1.2721	0.1381
4	9.9551	0.7108	1.1039	1.1773	19	9.9988	0.7003	1.2726	0.0111
($21^{h}.0$) 5	+ 9.9561	+ 0.7128	+ 1.1117	− 1.1705	($0^{h}.0$) 20	+ 0.0003	+ 0.6999	+ 1.2729	− 9.8307
6	9.9574	0.7153	1.1192	1.1634	21	0.0017	0.6981	1.2731	− 9.5157
7	9.9590	0.7174	1.1265	1.1562	22	0.0028	0.6955	1.2731	+ 8.3365
8	9.9609	0.7186	1.1335	1.1487	23	0.0036	0.6926	1.2730	9.5700
9	9.9629	0.7184	1.1403	1.1409	24	0.0041	0.6902	1.2728	9.8581
10	+ 9.9649	+ 0.7167	+ 1.1469	− 1.1328	25	+ 0.0043	+ 0.6889	+ 1.2725	+ 0.0298
11	9.9666	0.7136	1.1532	1.1245	26	0.0044	0.6892	1.2721	0.1523
12	9.9679	0.7096	1.1594	1.1158	27	0.0044	0.6912	1.2715	0.2479
13	9.9689	0.7052	1.1653	1.1069	28	0.0047	0.6946	1.2708	0.3262
14	9.9694	0.7012	1.1711	1.0977	29	0.0053	0.6989	1.2700	0.3923
15	+ 9.9696	+ 0.6983	+ 1.1766	− 1.0881	30	+ 0.0062	+ 0.7034	+ 1.2690	+ 0.4496
16	+ 9.9697	+ 0.6969	+ 1.1820	− 1.0782	31	+ 0.0074	+ 0.7073	+ 1.2679	+ 0.5002

$E = + 0''.04$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct. 1	+ 0 0074	+ 0.7073	+ 1.2679	+ 0.5002	Nov. 16	+ 0.0504	+ 0.7826	+ 1.0340	+ 1.2228
2	0.0088	0.7101	1.2667	0.5454	17	0.0515	0.7816	1.0229	1.2281
3	0.0103	0.7115	1.2653	0.5862	18	0.0523	0.7812	1.0114	1.2332
4	0.0118	0.7113	1.2638	0.6234	19	0.0529	0.7817	0.9995	1.2382
$(1^{h}.0)$ 5	0.0130	0.7100	1.2621	0.6576	$(4^{h}.0)$ 20	0.0534	0.7835	0.9871	1.2429
6	+ 0.0138	+ 0.7079	+ 1.2604	+ 0.6892	21	+ 0.0540	+ 0.7866	+ 0.9742	+ 1.2474
7	0.0143	0.7059	1.2585	0.7185	22	0.0549	0.7906	0.9607	1.2518
8	0.0144	0.7046	1.2564	0.7459	23	0.0560	0.7950	0.9467	1.2560
9	0.0144	0.7046	1.2542	0.7715	24	0.0575	0.7993	0.9320	1.2600
10	0.0143	0.7062	1.2519	0.7956	25	0.0592	0.8029	0.9167	1.2638
11	+ 0.0142	+ 0.7093	+ 1.2494	+ 0.8183	26	+ 0.0610	+ 0.8054	+ 0.9007	+ 1.2675
12	0.0144	0.7137	1.2468	0.8398	27	0.0629	0.8065	0.8839	1.2710
13	0.0150	0.7186	1.2440	0.8602	28	0.0646	0.8065	0.8663	1.2744
14	0.0159	0.7234	1.2410	0.8795	29	0.0661	0.8056	0.8478	1.2776
15	0.0172	0.7275	1.2379	0.8979	30	0.0673	0.8043	0.8283	1.2806
16	+ 0.0188	+ 0.7303	+ 1.2347	+ 0.9154	Dec. 1	+ 0.0682	+ 0.8031	+ 0.8078	+ 1.2835
17	0.0203	0.7317	1.2313	0.9322	2	0.0688	0.8025	0.7861	1.2862
18	0.0218	0.7317	1.2277	0.9482	3	0.0692	0.8031	0.7631	1.2888
19	0.0231	0.7308	1.2240	0.9635	4	0.0696	0.8048	0.7386	1.2912
$(2^{h}.0)$ 20	0.0242	0.7293	1.2202	0.9781	$(5^{h}.0)$ 5	0.0702	0.8076	0.7126	1.2935
21	+ 0.0249	+ 0.7281	+ 1.2161	+ 0.9922	6	+ 0.0711	+ 0.8112	+ 0.6847	+ 1.2956
22	0.0253	0.7278	1.2119	1.0057	7	0.0722	0.8150	0.6548	1.2976
23	0.0255	0.7288	1.2075	1.0187	8	0.0737	0.8184	0.6225	1.2994
24	0.0258	0.7313	1.2029	1.0312	9	0.0754	0.8211	0.5875	1.3011
25	0.0262	0.7351	1.1981	1.0432	10	0.0773	0.8225	0.5493	1.3027
26	+ 0.0268	+ 0.7399	+ 1.1932	+ 1.0548	11	+ 0.0793	+ 0.8227	+ 0.5071	+ 1.3041
27	0.0278	0.7451	1.1880	1.0659	12	0.0810	0.8219	0.4604	1.3054
28	0.0291	0.7499	1.1827	1.0767	13	0.0826	0.8202	0.4078	1.3065
29	0.0307	0.7538	1.1772	1.0870	14	0.0839	0.8184	0.3477	1.3075
30	0.0324	0.7564	1.1714	1.0970	15	0.0848	0.8168	0.2778	1.3084
31	+ 0.0340	+ 0.7576	+ 1.1654	+ 1.1067	16	+ 0.0856	+ 0.8160	+ 0.1943	+ 1.3091
Nov. 1	0.0355	0.7575	1.1592	1.1160	17	0.0863	0.8163	0.0902	1.3097
2	0.0366	0.7567	1.1528	1.1250	18	0.0870	0.8178	9.9533	1.3101
3	0.0374	0.7556	1.1461	1.1337	19	0.0879	0.8204	9.7520	1.3104
4	0.0379	0.7549	1.1392	1.1421	$(6^{h}.0)$ 20	0.0891	0.8233	+ 9.3655	1.3106
$(3^{h}.0)$ 5	+ 0.0382	+ 0.7552	+ 1.1321	+ 1.1502	21	+ 0 0905	+ 0.8263	− 9.0086	+ 1.3106
6	0.0384	0.7568	1.1247	1.1580	22	0.0921	0.8289	9.6385	1.3105
7	0.0386	0.7598	1.1170	1.1655	23	0.0939	0.8305	9.8854	1.3102
8	0.0390	0.7639	1.1091	1.1728	24	0.0958	0.8309	0.0418	1.3098
9	0.0397	0.7688	1.1008	1.1799	25	0.0976	0.8301	0.1565	1.3093
10	+ 0.0408	+ 0.7736	+ 1.0923	+ 1.1867	26	+ 0.0991	+ 0.8283	− 0.2472	+ 1.3087
11	0.0422	0.7780	1.0834	1.1933	27	0.1004	0.8259	0.3220	1.3079
12	0.0439	0.7813	1.0743	1.1996	28	0.1014	0.8235	0.3856	1.3069
13	0.0457	0.7833	1.0647	1.2058	29	0.1021	0.8215	0.4410	1.3058
14	0.0475	0.7840	1.0549	1.2117	30	0.1026	0.8205	0.4899	1.3046
15	+ 0.0491	+ 0.7836	+ 1.0446	+ 1.2174	31	+ 0.1030	+ 0.8206	− 0.5338	+ 1.3032
16	+ 0.0504	+ 0.7826	+ 1.0340	+ 1.2228	32	+ 0.1035	+ 0.8218	− 0.5735	+ 1.3017

$E = + 0''.04$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	"	s	° ′	h m	° ′	h m			"	
Jan.	1	0.0048	+15.36	+1.024	31 38	2 6.5	349 11	23 16.7	+0.8936	+1.3092	−1.66	−0.2199
	2	0.0076	15.56	1.038	31 20	2 5.4	348 14	23 12.9	0.8988	1.3089	1.80	0.2555
	3	0.0103	15.83	1.055	30 56	2 3.8	347 18	23 9.2	0.9036	1.3086	1.94	0.2882
($7^{h}.0$)	4	0.0130	16.06	1.070	30 28	2 1.9	346 21	23 5.4	0.9075	1.3083	2.08	0.3184
	5	0.0158	16.25	1.084	29 57	1 59.8	345 24	23 1.6	0.9106	1.3080	2.22	0.3466
	6	0.0185	+16.41	+1.094	29 27	1 57.8	344 27	22 57.8	+0.9126	+1.3078	−2.36	−0.3729
	7	0.0212	16.53	1.102	29 1	1 56.1	343 31	22 54.0	0.9138	1.3073	2.50	0.3976
	8	0.0240	16 60	1.107	28 42	1 54.8	342 34	22 50.3	0.9147	1.3069	2.64	0.4208
	9	0.0267	16.67	1.111	28 30	1 54.0	341 37	22 46.4	0.9155	1.3066	2.77	0.4428
	10	0.0295	16.73	1.115	28 24	1 53.6	340 39	22 42.6	0.9167	1.3062	2.91	0.4636
	11	0.0322	+16.81	+1.120	28 24	1 53.6	339 42	22 38.8	+0.9186	+1.3057	−3.04	−0.4833
	12	0.0349	16.91	1.127	28 26	1 53.7	338 45	22 35.0	0.9214	1.3053	3.18	0.5020
	13	0.0377	17.06	1.137	28 26	1 53.7	337 47	22 31.1	0.9251	1.3048	3.31	0.5197
	14	0.0404	17.24	1.149	28 21	1 53.4	336 50	22 27.3	0.9294	1.3044	3.44	0.5366
	15	0.0431	17.45	1.163	28 10	1 52.7	335 52	22 23.5	0.9341	1.3039	3.57	0.5528
	16	0.0459	+17.69	+1.179	27 52	1 51.5	334 54	22 19.6	+0.9388	+1.3034	−3.70	−0.5682
	17	0.0486	17.93	1.195	27 27	1 49.8	333 56	22 15.7	0.9430	1.3029	3.83	0 5830
	18	0.0514	18.15	1.210	26 58	1 47.9	332 58	22 11.9	0.9465	1.3023	3.95	0.5971
	19	0.0541	18.35	1.223	26 28	1 45.8	331 59	22 8.0	0.9492	1.3018	4.08	0.6108
($8^{h}.0$)	20	0.0568	18.51	1.234	25 59	1 43.9	331 1	22 4.0	0.9511	1.3012	4.21	0.6239
	21	0.0596	+18.63	+1.241	25 34	1 42.3	330 3	22 0.1	+0.9524	+1.3006	−4.33	−0.6364
	22	0.0623	18.71	1.247	25 16	1 41.1	329 4	21 56.3	0.9533	1.3001	4.45	0.6485
	23	0.0651	18.78	1.252	25 5	1 40.3	328 5	21 52.3	0.9543	1.2995	4.57	0.6601
	24	0.0678	18.84	1.256	25 0	1 40.0	327 6	21 48.4	0.9555	1.2989	4.69	0.6713
	25	0.0705	18.92	1.261	25 0	1 40.0	326 7	21 44.5	0.9574	1.2983	4.81	0.6820
	26	0.0733	+19.03	+1.269	25 2	1 40.1	325 8	21 40.5	+0.9600	+1.2976	−4.92	−0.6922
	27	0.0760	19.18	1.278	25 2	1 40.1	324 8	21 36.5	0.9632	1.2970	5.04	0.7021
	28	0.0787	19.35	1.290	24 58	1 39.9	323 8	21 32.5	0.9669	1.2964	5.15	0.7117
	29	0.0815	19.55	1.304	24 48	1 39.2	322 9	21 28.6	0.9707	1.2957	5.26	0.7210
	30	0.0842	19.75	1.317	24 32	1 38.1	321 9	21 24.6	0.9743	1.2951	5.37	0.7300
	31	0.0870	+19.95	+1.330	24 10	1 36.7	320 9	21 20.6	+0.9775	+1.2944	−5.48	−0.7386
Feb.	1	0.0897	20.12	1.341	23 46	1 35.0	319 9	21 16.6	0.9798	1.2936	5.58	0.7469
	2	0.0924	20.26	1.350	23 21	1 33.4	318 8	21 12.5	0.9814	1.2931	5.69	0.7549
	3	0.0952	20.35	1.356	22 58	1 31.8	317 8	21 8.5	0.9822	1.2924	5.79	0.7626
($9^{h}.0$)	4	0.0979	20.41	1.361	22 39	1 30.6	316 7	21 4.5	0.9825	1.2918	5.89	0.7701
	5	0.1006	+20.44	+1.363	22 27	1 29.8	315 6	21 0.4	+0.9825	+1.2911	−5.99	−0.7773
	6	0.1034	20.47	1.364	22 22	1 29.4	314 5	20 56.3	0.9827	1.2905	6.08	0.7842
	7	0.1061	20.50	1.366	22 21	1 29.4	313 4	20 52.3	0.9833	1.2898	6.18	0.7909
	8	0.1089	20.55	1.370	22 25	1 29.7	312 2	20 48.2	0.9846	1.2891	6.27	0.7974
	9	0.1116	20.64	1.377	22 29	1 29.9	311 1	20 44.1	0.9867	1.2885	6.36	0.8036
	10	0.1143	+20.77	+1.386	22 30	1 30.0	309 59	20 39.9	+0.9896	+1.2878	−6.45	−0.8096
	11	0.1171	20.94	1.397	22 26	1 29.7	308 57	20 35.8	0.9929	1.2872	6.53	0.8153
	12	0.1198	21.14	1.409	22 17	1 29.1	307 55	20 31.7	0.9964	1.2865	6.62	0.8209
	13	0.1226	21.34	1.422	22 1	1 28.1	306 53	20 27.5	0.9998	1.2859	6.70	0.8263
	14	0.1253	21.53	1.435	21 41	1 26.7	305 51	20 23.4	1.0026	1.2852	6.78	0.8315
	15	0.1280	+21.69	+1.446	21 19	1 25.2	304 48	20 19.2	+1.0048	+1.2846	−6.86	−0.8364
	16	0.1308	+21.82	+1.455	20 56	1 23.7	303 46	20 15.0	+1.0063	+1.2840	−6.93	−0.8412

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Feb. 16	0.1308	+21.82	+1.455	20 56	1 23.7	303 46	20 15.0	+1.0063	+1.2840	−6.93	−0.8412
17	0 1335	21.92	1.461	20 36	1 22.4	302 43	20 10.9	1.0072	1.2834	7.01	0.8458
18	0.1362	21.96	1.465	20 21	1 21.4	301 40	20 6.7	1.0076	1.2828	7.08	0.8502
($10^{h}.0$) 19	0.1390	22.00	1.466	20 12	1 20.8	300 37	20 2.4	1.0078	1.2822	7.15	0.8544
20	0.1417	22.03	1.468	20 10	1 20.6	299 33	19 58.2	1.0082	1.2817	7.22	0.8585
21	0.1445	+22.06	+1.471	20 12	1 20.8	298 30	19 54.0	+1.0090	+1.2811	−7.28	−0.8624
22	0.1472	22.12	1.475	20 18	1 21.2	297 27	19 49.8	1.0105	1.2805	7.35	0.8662
23	0.1499	22.21	1.481	20 24	1 21.6	296 23	19 45.5	1.0126	1.2800	7.41	0.8697
24	0.1527	22.34	1.489	20 27	1 21.8	295 19	19 41.3	1.0152	1.2795	7.47	0.8730
25	0.1554	22.50	1.500	20 25	1 21.7	294 15	19 37.0	1.0182	1.2790	7.52	0.8763
26	0.1581	+22.66	+1.511	20 18	1 21.2	293 11	19 32.7	+1.0211	+1.2785	−7.57	−0.8793
27	0.1609	22.83	1.522	20 6	1 20.4	292 7	19 28.5	1.0237	1.2780	7 62	0.8823
28	0.1636	22.98	1.532	19 50	1 19.3	291 3	19 24.2	1.0257	1.2776	7.67	0.8851
Mar. 1	0.1664	23.09	1.539	19 32	1 18.1	289 59	19 19.9	1.0270	1.2772	7.72	0.8877
2	0.1691	23.16	1.544	19 15	1 17.0	288 54	19 15 6	1.0277	1.2768	7.76	0.8902
3	0.1718	+23.19	+1.546	19 1	1 16.1	287 50	19 11.3	+1.0277	+1.2764	−7.81	−0.8925
4	0.1746	23.20	1.546	18 53	1 15.5	286 45	19 7.0	1.0275	1.2760	7.85	0.8946
5	0.1773	23.19	1.546	18 51	1 15.4	285 41	19 2.7	1.0271	1.2757	7.89	0.8966
($11^{h}.0$) 6	0.1800	23.19	1.546	18 54	1 15.6	284 36	18 58.4	1.0272	1.2753	7.92	0.8985
7	0.1828	23.20	1.547	19 1	1 16.1	283 31	18 54.1	1.0277	1.2750	7.95	0.9003
8	0.1855	+23.25	+1.550	19 11	1 16.7	282 27	18 49.8	+1.0290	+1.2747	−7.98	−0.9019
9	0.1883	23.33	1.555	19 19	1 17.3	281 22	18 45.5	1.0310	1.2745	8.01	0.9034
10	0.1910	23.46	1.564	19 24	1 17.6	280 17	18 41.1	1.0336	1.2742	8.03	0.9046
11	0.1937	23.62	1.574	19 23	1 17.6	279 12	18 36.8	1.0365	1.2740	8.05	0.9058
12	0.1965	23.79	1.586	19 17	1 17.1	278 7	18 32.5	1.0394	1.2738	8.07	0.9069
13	0.1992	+23.96	+1.597	19 6	1 16.4	277 2	18 28.1	+1.0420	+1.2736	−8.09	−0.9078
14	0.2020	24.11	1.608	18 52	1 15.5	275 57	18 23.8	1.0441	1.2735	8.10	0.9086
15	0.2047	24.23	1.615	18 37	1 14.4	274 52	18 19.5	1.0456	1.2734	8.12	0.9093
16	0.2074	24.31	1.620	18 23	1 13.5	273 47	18 15.1	1.0464	1.2733	8.13	0.9098
17	0.2102	24.35	1.624	18 13	1 12.9	272 42	18 10.8	1.0468	1.2732	8.13	0.9101
18	0.2129	+24.37	+1.625	18 9	1 12.6	271 37	18 6.5	+1.0469	+1.2732	−8.13	−0.9103
19	0.2156	24.38	1.625	18 10	1 12.7	270 32	18 2.1	1.0471	1.2731	8.14	0.9105
20	0.2184	24.39	1.626	18 17	1 13.1	269 27	17 57.8	1.0476	1.2731	8.14	0.9106
($12^{h}.0$) 21	0.2211	24.43	1.628	18 27	1 13.8	268 22	17 53.5	1.0486	1.2732	8.14	0.9104
22	0.2239	24.50	1.632	18 38	1 14.6	267 17	17 49.1	1.0503	1.2732	8.13	0.9101
23	0.2266	+24.60	+1.639	18 48	1 15.2	266 13	17 44.8	+1.0526	+1.2733	−8.12	−0.9097
24	0.2293	24.73	1.649	18 54	1 15.6	265 8	17 40.5	1.0552	1.2734	8.11	0.9092
25	0.2321	24.88	1.659	18 55	1 15.7	264 3	17 36.2	1.0580	1.2735	8.10	0.9086
26	0.2348	25.04	1.670	18 51	1 15.4	262 59	17 31.9	1.0606	1.2736	8.09	0.9078
27	0.2375	25.19	1.679	18 43	1 14.8	261 54	17 27.6	1.0627	1.2738	8.07	0.9069
28	0.2403	+25.30	+1.686	18 32	1 14.1	260 50	17 23.3	+1.0642	+1.2740	−8.05	−0.9058
29	0.2430	25.37	1.692	18 21	1 13.4	259 46	17 19.0	1.0651	1.2742	8.03	0.9046
30	0.2458	25.42	1.695	18 13	1 12.8	258 41	17 14.7	1.0655	1.2744	8.00	0.9033
31	0.2485	25.43	1.696	18 9	1 12.6	257 37	17 10.5	1.0654	1.2747	7.98	0.9019
32	0.2512	25.42	1.695	18 10	1 12.6	256 33	17 6.2	1.0653	1.2750	7.95	0.9003
33	0.2540	+25.41	+1.694	18 16	1 13.1	255 29	17 2.0	+1.0654	+1.2753	−7.92	−0.8986
34	0.2567	+25.41	+1.694	18 27	1 13.8	254 26	16 57.7	+1.0659	+1.2756	−7.89	−0.8968

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		r	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
April	1	0.2512	+25.42	+1.695	18 10	1 12.6	256 33	17 6.2	+1.0653	+1.2750	-7.95	-0.9003
	2	0.2540	25.41	1.694	18 16	1 13.1	255 29	17 2.0	1.0654	1.2753	7.92	0.8986
	3	0.2567	25.41	1.694	18 27	1 13.8	254 26	16 57.7	1.0659	1.2756	7.89	0.8968
	4	0.2595	25.45	1.696	18 40	1 14.7	253 22	16 53.5	1.0670	1.2759	7.85	0.8948
	5	0.2622	25.52	1.701	18 53	1 15.5	252 19	16 49.2	1.0689	1.2763	7.81	0.8927
(13h.0)	6	0.2649	+25.64	+1.709	19 3	1 16.2	251 15	16 45.0	+1.0713	+1.2767	-7.77	-0.8905
	7	0.2677	25.79	1.719	19 9	1 16.6	250 12	16 40.8	1.0742	1.2771	7.73	0.8881
	8	0.2704	25.97	1.731	19 10	1 16.7	249 9	16 36.6	1.0772	1.2775	7.68	0.8856
	9	0.2731	26.15	1.743	19 5	1 16.4	248 6	16 32.4	1.0800	1.2780	7.64	0.8829
	10	0.2759	26.31	1.754	18 57	1 15.8	247 4	16 28.3	1.0823	1.2784	7.59	0.8800
	11	0.2786	+26.45	+1.763	18 48	1 15.2	246 1	16 24.1	+1.0842	+1.2789	-7.53	-0.8771
	12	0.2813	26.55	1.770	18 38	1 14.6	244 59	16 19.9	1.0855	1.2794	7.48	0.8740
	13	0.2841	26.62	1.775	18 32	1 14.1	243 57	16 15.8	1.0863	1.2799	7.43	0.8708
	14	0.2868	26.65	1.777	18 30	1 14.0	242 55	16 11.6	1.0868	1.2804	7.37	0.8674
	15	0.2896	26.68	1.778	18 33	1 14.2	241 53	16 7.5	1.0873	1.2809	7.31	0.8638
	16	0.2923	+26.70	+1.780	18 41	1 14.7	240 51	16 3.4	+1.0881	+1.2814	-7.24	-0.8601
	17	0.2950	26.75	1.783	18 53	1 15.5	239 50	15 59.3	1.0893	1.2820	7.18	0.8562
	18	0.2978	26.82	1.788	19 6	1 16.4	238 49	15 55.2	1.0911	1.2825	7.11	0.8522
	19	0.3005	26.93	1.795	19 18	1 17.2	237 48	15 51.2	1.0934	1.2831	7.05	0.8480
	20	0.3032	27.07	1.805	19 28	1 17.9	236 47	15 47.2	1.0961	1.2837	6.98	0.8436
(14h.0)	21	0.3060	+27.24	+1.816	19 33	1 18.2	235 46	15 43.2	+1.0990	+1.2843	-6.90	-0.8391
	22	0.3087	27.42	1.828	19 33	1 18.2	234 46	15 39.1	1.1019	1.2849	6.83	0.8344
	23	0.3115	27.60	1.840	19 29	1 17.9	233 45	15 35.1	1.1045	1.2855	6.75	0.8296
	24	0.3142	27.75	1.850	19 22	1 17.4	232 45	15 31.1	1.1065	1.2861	6.68	0.8245
	25	0.3169	27.86	1.858	19 14	1 16.9	231 46	15 27.1	1.1080	1.2867	6.60	0.8192
	26	0.3197	+27.94	+1.863	19 7	1 16.5	230 46	15 23.2	+1.1089	+1.2873	-6.51	-0.8138
	27	0.3224	27.98	1.866	19 4	1 16.2	229 47	15 19.2	1.1094	1.2880	6.43	0.8082
	28	0.3252	28.00	1.867	19 5	1 16.3	228 47	15 15.2	1.1098	1.2886	6.34	0.8024
	29	0.3279	28.02	1.868	19 11	1 16.7	227 48	15 11.3	1.1102	1.2892	6.26	0.7964
	30	0.3306	28.04	1.869	19 21	1 17.4	226 50	15 7.3	1.1111	1.2898	6.17	0.7902
May	1	0.3334	+28.09	+1.873	19 33	1 18.2	225 51	15 3.4	+1.1124	+1.2905	-6.08	-0.7837
	2	0.3361	28.18	1.879	19 46	1 19.1	224 53	14 59.5	1.1144	1.2911	5.98	0.7771
	3	0.3388	28.32	1.888	19 57	1 19.8	223 55	14 55.6	1.1169	1.2917	5.89	0.7702
	4	0.3416	28.49	1.899	20 4	1 20.3	222 57	14 51.7	1.1199	1.2924	5.79	0.7631
	5	0.3443	28.69	1.912	20 7	1 20.4	221 59	14 47.9	1.1231	1.2930	5.70	0.7557
(15h.0)	6	0.3471	+28.90	+1.926	20 4	1 20.3	221 1	14 44.0	+1.1261	+1.2936	-5.60	-0.7481
	7	0.3498	29.10	1.940	19 58	1 19.9	220 4	14 40.2	1.1289	1.2943	5.50	0.7403
	8	0.3525	29.28	1.952	19 49	1 19.3	219 7	14 36.4	1.1311	1.2949	5.40	0.7322
	9	0.3553	29.43	1.962	19 40	1 18.7	218 10	14 32.6	1.1329	1.2955	5.30	0.7238
	10	0.3580	29.53	1.969	19 33	1 18.2	217 13	14 28.8	1.1342	1.2961	5.19	0.7151
	11	0.3607	+29.61	+1.974	19 30	1 18.0	216 16	14 25.0	+1.1352	+1.2967	-5.08	-0.7061
	12	0.3635	29.67	1.978	19 31	1 18.1	215 19	14 21.2	1.1361	1.2973	4.98	0.6969
	13	0.3662	29.73	1.982	19 36	1 18.4	214 23	14 17.5	1.1372	1.2979	4.87	0.6873
	14	0.3690	29.80	1.987	19 45	1 19.0	213 27	14 13.8	1.1386	1.2985	4.76	0.6773
	15	0.3717	29.90	1.993	19 55	1 19.7	212 31	14 10.1	1.1405	1.2990	4.65	0.6670
	16	0.3744	+30.03	+2.002	20 6	1 20.4	211 35	14 6.4	+1.1429	+1.2996	-4.53	-0.6563
	17	0.3772	+30.20	+2.013	20 14	1 20.9	210 39	14 2.7	+1.1457	+1.3002	-4.42	-0.6452

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
May	16	0.3744	+30.03	+2.002	20 6	1 20.4	211 35	14 6.4	+1.1429	+1.2996	–4.53	–0.6563
	17	0.3772	30.20	2.013	20 14	1 20.9	210 39	14 2.7	1.1457	1.3002	4.42	0.6452
	18	0.3799	30.40	2.027	20 18	1 21.2	209 44	13 59.0	1.1487	1.3008	4.30	0.6337
	19	0.3827	30.61	2.041	20 18	1 21.2	208 49	13 55.3	1.1518	1.3013	4.18	0.6217
	20	0.3854	30.82	2.055	20 13	1 20.9	207 54	13 51.6	1.1546	1.3018	4.07	0.6093
($16^{h}.0$)	21	0.3881	+31.02	+2.068	20 6	1 20.4	206 58	13 47.9	+1.1569	+1.3023	–3.95	–0.5965
	22	0.3909	31.18	2.078	19 57	1 19.8	206 4	13 44.2	1.1588	1.3028	3.83	0.5831
	23	0.3936	31.30	2.087	19 49	1 19.2	205 9	13 40.5	1.1601	1.3033	3.71	0.5691
	24	0.3963	31.39	2.093	19 43	1 18.8	204 14	13 36.9	1.1611	1 3038	3.58	0.5545
	25	0.3991	31.45	2.096	19 40	1 18.7	203 20	13 33.3	1.1618	1.3043	3.46	0.5393
	26	0.4018	+31.49	+2.099	19 42	1 18.8	202 26	13 29.7	+1.1624	+1.3047	–3.34	–0.5235
	27	0.4046	31.54	2.103	19 48	1 19.2	201 31	13 26.1	1.1634	1.3052	3.21	0.5070
	28	0.4073	31.61	2.108	19 56	1 19.7	200 37	13 22.5	1.1647	1.3056	3.09	0.4897
	29	0.4100	31.72	2.115	20 5	1 20.3	199 43	13 18.9	1.1666	1.3060	2.96	0.4716
	30	0.4128	31.87	2.124	20 13	1 20.9	198 50	13 15.3	1.1691	1.3064	2.83	0.4525
	31	0.4155	+32.06	+2.137	20 18	1 21.2	197 56	13 11.7	+1.1719	+1.3067	–2.70	–0.4325
June	1	0.4182	32.28	2.152	20 19	1 21.3	197 2	13 8.1	1.1749	1.3071	2.58	0.4113
	2	0.4210	32.52	2.168	20 15	1 21.0	196 9	13 4.5	1.1779	1.3074	2.45	0.3890
	3	0.4237	32.75	2.184	20 8	1 20.5	195 15	13 1.0	1.1807	1.3078	2.32	0.3653
	4	0.4264	32.97	2.198	19 58	1 19.9	194 22	12 57.4	1.1831	1.3081	2.19	0.3401
($17^{h}.0$)	5	0.4292	+33.15	+2.210	19 47	1 19.1	193 29	12 53.9	+1.1850	+1.3084	–2.06	–0.3132
	6	0.4319	33.30	2.220	19 37	1 18.5	192 36	12 50.4	1.1865	1.3087	1.93	0.2844
	7	0.4347	33.41	2.228	19 30	1 18.0	191 43	12 46.8	1.1877	1.3089	1.79	0.2535
	8	0.4374	33.50	2.234	19 27	1 17.8	190 50	12 43.3	1.1887	1.3091	1.66	0.2200
	9	0.4401	33.59	2.239	19 27	1 17.8	189 57	12 39.8	1.1898	1.3093	1.53	0.1837
	10	0.4429	+33.68	+2.245	19 31	1 18.1	189 4	12 36.3	+1.1911	+1.3095	–1.39	–0.1439
	11	0.4456	33.79	2.252	19 37	1 18.5	188 11	12 32.7	1.1928	1.3097	1.26	0.0999
	12	0.4484	33.93	2.263	19 43	1 18.9	187 18	12 29.2	1.1949	1.3099	1.13	0.0509
	13	0.4511	34.11	2.274	19 48	1 19.2	186 26	12 25.7	1.1974	1.3101	0.99	9.9954
	14	0.4538	34.32	2.288	19 50	1 19.3	185 33	12 22.2	1.2002	1.3102	0.86	9.9316
	15	0.4566	+34.55	+2.304	19 48	1 19.2	184 40	12 18.7	+1.2030	+1.3103	–0.72	–9.8567
	16	0.4593	34.79	2.319	19 42	1 18.8	183 48	12 15.2	1.2057	1.3104	0.58	9.7657
	17	0.4620	35.01	2.334	19 33	1 18.2	182 55	12 11.7	1.2080	1.3105	0.45	9.6499
	18	0.4648	35.20	2.346	19 22	1 17.5	182 2	12 8.2	1.2099	1.3105	0.31	9.4900
	19	0.4675	35.35	2.357	19 11	1 16.7	181 10	12 4.7	1.2113	1.3106	0.17	9.2243
	20	0.4703	+35.46	+2.364	19 2	1 16.1	180 18	12 1.2	+1.2123	+1.3107	–0.04	–8.6021
($18^{h}.0$)	21	0.4730	35.54	2.370	18 55	1 15.7	179 25	11 57.7	1.2130	1.3106	+0.09	+8 9542
	22	0.4757	35.60	2.374	18 52	1 15.5	178 33	11 54.2	1.2136	1.3106	0.22	9.3348
	23	0.4785	35.66	2.377	18 53	1 15.5	177 40	11 50.7	1.2143	1.3105	0.35	9.5502
	24	0.4812	35.74	2.382	18 57	1 15.8	176 48	11 47.2	1.2154	1.3105	0.49	9.6917
	25	0.4839	+35.84	+2.390	19 2	1 16.1	175 55	11 43.7	+1.2169	+1.3104	+0.63	+9.7978
	26	0.4867	35.98	2.400	19 6	1 16.4	175 3	11 40.2	1.2188	1.3103	0.76	9.8827
	27	0.4894	36.17	2.412	19 8	1 16.5	174 10	11 36.7	1.2211	1.3102	0.90	9.9535
	28	0.4922	36.39	2.426	19 8	1 16.5	173 17	11 33.2	1.2238	1.3101	1.03	0.0142
	29	0.4949	36.63	2.442	19 3	1 16.2	172 25	11 29.6	1.2264	1.3099	1.17	0.0673
	30	0.4976	+36.87	+2.458	18 55	1 15.7	171 32	11 26.1	+1.2289	+1.3097	+1.30	+0.1145
	31	0.5004	+37.10	+2.473	18 44	1 14.9	170 39	11 22.6	+1.2311	+1.3095	+1.43	+0.1570

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
July 1	0.5004	+37.10	+2.473	18 44	1 14.9	170 39	11 22.6	+1.2311	+1.3095	+1.43	+0.1570
2	0.5031	37.30	2.486	18 31	1 14.1	169 47	11 19.1	1.2328	1.3093	1.57	0.1954
3	0.5059	37.46	2.498	18 19	1 13.3	168 54	11 15.6	1.2342	1.3091	1.70	0.2307
4	0.5086	37.58	2.506	18 9	1 12.6	168 1	11 12.1	1.2352	1.3089	1.83	0.2633
5	0.5113	37.68	2.512	18 2	1 12.1	167 8	11 8.5	1.2360	1.3086	1.97	0.2935
(19^h.0) 6	0.5141	+37.76	+2.517	17 58	1 11.9	166 15	11 5.0	+1.2368	+1.3083	+2.10	+0.3215
7	0.5168	37.84	2.523	17 58	1 11.9	165 22	11 1.5	1.2377	1.3080	2.23	0.3477
8	0.5195	37.94	2.530	18 0	1 12.0	164 29	10 57.9	1.2390	1.3077	2.36	0.3723
9	0.5223	38.06	2.537	18 4	1 12.5	163 36	10 54.4	1.2406	1.3074	2.49	0.3956
10	0.5250	38.23	2.548	18 6	1 12.4	162 42	10 50.8	1.2425	1.3070	2.62	0.4176
11	0.5278	+38.43	+2.562	18 7	1 12.4	161 49	10 47.3	+1.2448	+1.3066	+2.74	+0.4383
12	0.5305	38.64	2.576	18 4	1 12.3	160 55	10 43.7	1.2471	1.3063	2.87	0.4579
13	0.5332	38.87	2.590	17 58	1 11.8	160 2	10 40.1	1.2494	1.3059	3.00	0.4766
14	0.5360	39.09	2.605	17 48	1 11.2	159 8	10 36.5	1.2514	1.3055	3.12	0.4944
15	0.5387	39.26	2.618	17 37	1 10.5	158 14	10 32.9	1.2531	1.3050	3.25	0.5114
16	0.5414	+39.43	+2.628	17 25	1 9.7	157 20	10 29.3	+1.2543	+1.3046	+3.37	+0.5277
17	0.5442	39.54	2.636	17 14	1 8.9	156 26	10 25.7	1.2551	1.3042	3.49	0.5433
18	0.5469	39.62	2.641	17 5	1 8.3	155 32	10 22.1	1.2556	1.3037	3.62	0.5582
19	0.5497	39.66	2.644	16 59	1 7.9	154 38	10 18.5	1.2559	1.3032	3.74	0.5725
20	0.5524	39.70	2.646	16 56	1 7.8	153 43	10 14.9	1.2562	1.3027	3.86	0.5863
(20^h.0) 21	0.5551	+39.75	+2.650	16 57	1 7.8	152 49	10 11.2	+1.2568	+1.3022	+3.98	+0.5995
22	0.5579	39.82	2.655	17 0	1 8.0	151 54	10 7.6	1.2577	1.3017	4.10	0.6122
23	0.5606	39.93	2.662	17 3	1 8.2	150 59	10 3.9	1.2590	1.3012	4.21	0.6244
24	0.5633	40.08	2.672	17 4	1 8.3	150 4	10 0.3	1.2607	1.3006	4.33	0.6361
25	0.5661	40.27	2.685	17 4	1 8.2	149 9	9 56.6	1.2628	1.3001	4.44	0.6474
26	0.5688	+40.48	+2.699	17 0	1 8.0	148 14	9 52.9	+1.2649	+1.2995	+4.55	+0.6584
27	0.5716	40.70	2.713	16 52	1 7.5	147 18	9 49.2	1.2670	1.2990	4.67	0.6690
28	0.5743	40.91	2.727	16 42	1 6.8	146 23	9 45.5	1.2688	1.2984	4.78	0.6792
29	0.5770	41.10	2.740	16 30	1 6.0	145 27	9 41.8	1.2703	1.2978	4.89	0.6889
30	0.5798	41.25	2.750	16 17	1 5.2	144 31	9 38.1	1.2714	1.2972	5.00	0.6984
31	0.5825	+41.36	+2.757	16 6	1 4.4	143 35	9 34.3	+1.2720	+1.2966	+5.10	+0.7076
Aug. 1	0.5853	41.43	2.762	15 58	1 3.9	142 39	9 30.6	1.2726	1.2960	5.20	0.7164
2	0.5880	41.49	2.766	15 53	1 3.5	141 42	9 26.8	1.2730	1.2954	5.31	0.7250
3	0.5907	41.54	2.769	15 51	1 3.4	140 46	9 23.1	1.2735	1.2948	5.41	0.7333
4	0.5935	41.60	2.773	15 52	1 3.4	139 49	9 19.3	1.2742	1.2942	5.51	0.7413
(21^h.0) 5	0.5962	+41.69	+2.779	15 54	1 3.6	138 52	9 15.5	+1.2752	+1.2936	+5.61	+0.7491
6	0.5989	41.82	2.788	15 56	1 3.8	137 55	9 11.7	1.2766	1.2930	5.71	0.7566
7	0.6017	41.98	2.798	15 57	1 3.8	136 58	9 7.8	1.2782	1.2923	5.81	0.7638
8	0.6044	42.16	2.810	15 56	1 3.7	136 0	9 4.0	1.2801	1.2917	5.90	0.7708
9	0.6072	42.35	2.823	15 51	1 3.4	135 3	9 0.2	1.2819	1.2913	5.99	0.7776
10	0.6099	+42.54	+2.836	15 44	1 2.9	134 5	8 56.3	+1.2836	+1.2905	+6.08	+0.7842
11	0.6126	42.71	2.847	15 34	1 2.3	133 6	8 52.4	1.2850	1.2898	6.18	0.7906
12	0.6154	42.85	2.857	15 23	1 1.5	132 8	8 48.5	1.2860	1.2892	6.26	0.7967
13	0.6181	42.94	2.863	15 12	1 0.8	131 10	8 44.6	1.2865	1.2886	6.35	0.8027
14	0.6208	42.99	2.866	15 3	1 0.2	130 11	8 40.7	1.2868	1.2879	6.43	0.8085
15	0.6236	+43.01	+2.867	14 57	0 59.8	129 12	8 36.8	+1.2868	+1.2873	+6.52	+0.8141
16	0.6263	+43.02	+2.868	14 54	0 59.6	128 13	8 32.9	+1.2868	+1.2867	+6.60	+0.8195

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Aug. 16	0.6263	+43.02	+2.868	14 54	0 59.6	128 13	8 32.9	+1.2868	+1.2867	+6.60	+0.8195
17	0.6291	43.03	2.869	14 54	0 59.6	127 14	8 28.9	1.2869	1.2861	6.68	0.8247
18	0.6318	43.07	2.871	14 57	0 59.8	126 15	8 25.0	1.2873	1.2855	6.76	0.8297
19	0.6345	43.13	2.876	15 0	1 0.0	125 15	8 21.0	1.2880	1.2849	6.83	0.8345
20	0.6373	43.23	2.882	15 3	1 0.2	124 15	8 17.0	1.2892	1.2843	6.90	0.8391
($22^{\rm h}.0$) 21	0.6400	+43.37	+2.891	15 5	1 0.3	123 15	8 13.0	+1.2906	+1.2837	+6.97	+0.8436
22	0.6428	43.54	2.903	15 3	1 0.2	122 15	8 9.0	1.2923	1.2831	7.05	0.8479
23	0.6455	43.72	2.915	14 59	0 59.9	121 15	8 5.0	1.2940	1.2826	7.11	0.8520
24	0.6482	43.91	2.927	14 51	0 59 4	120 14	8 1.0	1.2955	1.2820	7.18	0.8560
25	0.6510	44.07	2.938	14 41	0 58.8	119 14	7 56.9	1.2968	1.2815	7.24	0.8598
26	0.6537	+44.19	+2.946	14 31	0 58.1	118 13	7 52.9	+1.2977	+1.2809	+7.30	+0.8635
27	0.6564	44.28	2.952	14 22	0 57.4	117 12	7 48.8	1.2982	1.2804	7.36	0.8670
28	0.6592	44.33	2.955	14 14	0 56.9	116 10	7 44.7	1.2985	1.2799	7.42	0.8703
29	0.6619	44.36	2.958	14 9	0 56.6	115 9	7 40.6	1.2986	1.2794	7.47	0.8735
30	0.6647	44.38	2.959	14 8	0 56.5	114 7	7 36.5	1.2988	1.2789	7.52	0.8766
31	0.6674	+44.41	+2.961	14 10	0 56.6	113 6	7 32.4	+1.2991	+1.2785	+7.58	+0.8796
Sept. 1	0.6701	44.46	2.964	14 13	0 56.9	112 4	7 28.3	1.2997	1.2781	7.63	0.8824
2	0.6729	44.54	2.969	14 18	0 57.2	111 2	7 24.1	1.3006	1.2776	7.67	0.8850
3	0.6756	44.65	2.976	14 21	0 57.4	110 0	7 20.0	1.3019	1.2772	7.71	0.8876
4	0.6783	44.80	2.986	14 23	0 57.5	108 57	7 15.8	1.3033	1.2768	7.76	0.8900
($23^{\rm h}.0$) 5	0.6811	+44.97	+2.997	14 22	0 57.4	107 55	7 11.7	+1.3049	+1.2764	+7.80	+0.8923
6	0.6838	45.14	3.009	14 18	0 57.2	106 52	7 7.5	1.3063	1.2761	7.84	0.8944
7	0.6865	45.28	3.018	14 11	0 56.7	105 50	7 3.3	1.3075	1.2757	7.88	0.8964
8	0.6893	45.39	3.026	14 3	0 56.2	104 47	6 59.1	1.3084	1.2754	7.91	0.8982
9	0.6920	45.47	3.031	13 55	0 55.6	103 44	6 54.9	1.3089	1.2751	7.94	0.8999
10	0.6948	+45.51	+3.033	13 48	0 55.2	102 41	6 50.7	+1.3091	+1.2748	+7.97	+0.9015
11	0.6975	45.51	3.034	13 43	0 54.9	101 37	6 46.5	1.3090	1.2745	8.00	0.9030
12	0.7002	45.50	3.033	13 41	0 54.8	100 34	6 42.3	1.3088	1.2743	8.02	0.9043
13	0.7030	45.48	3.032	13 43	0 54.9	99 31	6 38.0	1.3087	1.2741	8.04	0.9055
14	0.7057	45.48	3.032	13 47	0 55.1	98 27	6 33.8	1.3088	1.2739	8.06	0.9066
15	0.7085	+45.51	+3.034	13 53	0 55.5	97 23	6 29.5	+1.3093	+1.2737	+8.08	+0.9076
16	0.7112	45.58	3.038	13 59	0 55.9	96 20	6 25.3	1.3101	1.2736	8.10	0.9083
17	0.7139	45.69	3.046	14 3	0 56.2	95 16	6 21.1	1.3113	1.2734	8.11	0.9090
18	0.7167	45.83	3.056	14 5	0 56.4	94 12	6 16.8	1.3127	1.2733	8.12	0.9096
19	0.7194	45.99	3.066	14 5	0 56.3	93 8	6 12.5	1.3142	1.2732	8.13	0.9100
($0^{\rm h}.0$) 20	0.7221	+46.15	+3.077	14 1	0 56.1	92 4	6 8.3	+1.3156	+1.2732	+8.13	+0.9103
21	0.7249	46.30	3.086	13 55	0 55.7	91 0	6 4.0	1 3169	1.2731	8.14	0.9105
22	0.7276	46.42	3.094	13 48	0 55.2	89 56	5 59.7	1.3178	1.2731	8.14	0.9106
23	0.7304	46.51	3.101	13 41	0 54.7	88 52	5 55.5	1.3184	1.2731	8.14	0.9105
24	0.7331	46.56	3.104	13 36	0 54.4	87 48	5 51.2	1.3187	1.2732	8.13	0.9103
25	0.7358	+46.58	+3.105	13 34	0 54.2	86 44	5 46.9	+1.3188	+1.2732	+8.13	+0.9100
26	0.7386	46.59	3.106	13 34	0 54.3	85 39	5 42.6	1.3188	1.2733	8.12	0.9095
27	0.7413	46.60	3.106	13 38	0 54.5	84 35	5 38.3	1.3190	1 2734	8.11	0.9089
28	0.7440	46.63	3.108	13 43	0 54.9	83 31	5 34.1	1.3195	1.2735	8.09	0.9081
29	0.7468	46.69	3.113	13 50	0 55.3	82 27	5 29.8	1.3203	1.2737	8.07	0.9073
30	0.7495	+46.78	+3.119	13 57	0 55.8	81 23	5 25.5	+1.3214	+1.2739	+8.06	+0.9064
31	0.7523	+46.91	+3.128	14 2	0 56.1	80 19	5 21.2	+1.3228	+1.2741	+8.04	+0.9053

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		r	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7523	+46.91	+3.128	14 2	0 56.1	80 19	5 21.2	+1.3228	+1.2741	+8.04	+0.9053
	2	0.7550	47.07	3 138	14 4	0 56.3	79 15	5 16.9	1.3243	1.2743	8.02	0.9040
	3	0.7577	47.23	3.149	14 4	0 56.3	78 11	5 12.7	1.3258	1.2745	7.99	0.9026
	4	0.7605	47.39	3.159	14 1	0 56.1	77 6	5 8.4	1.3271	1.2748	7.96	0.9011
(1^{h}.0)	5	0.7632	47.52	3.167	13 56	0 55.8	76 2	5 4.1	1.3281	1.2751	7.93	0.8995
	6	0.7660	+47.61	+3.174	13 51	0 55.4	74 58	4 59.9	+1.3288	+1.2754	+7.90	+0.8977
	7	0.7687	47.66	3.177	13 46	0 55.1	73 55	4 55.6	1.3292	1.2758	7.86	0.8957
	8	0.7714	47.68	3.178	13 44	0 54.9	72 51	4 51.4	1.3292	1.2761	7.83	0.8937
	9	0.7742	47.67	3.178	13 44	0 54.9	71 47	4 47.1	1.3291	1.2765	7.79	0.8915
	10	0.7769	47.65	3.177	13 47	0 55.1	70 43	4 42.9	1.3291	1.2769	7.75	0.8892
	11	0.7796	+47.65	+3.177	13 52	0 55.5	69 40	4 38.7	+1.3293	+1.2773	+7.71	+0.8867
	12	0.7824	47.68	3.178	14 0	0 56.0	68 36	4 34.4	1.3297	1.2777	7.66	0.8841
	13	0.7851	47.73	3.182	14 9	0 56.6	67 33	4 30.2	1.3305	1.2782	7.61	0.8813
	14	0.7879	47.84	3.190	14 16	0 57.1	66 30	4 26.0	1.3317	1.2786	7.56	0.8784
	15	0.7906	47.98	3.199	14 21	0 57.4	65 26	4 21.7	1.3332	1.2791	7.50	0.8753
	16	0.7933	+48.15	+3.210	14 24	0 57.6	64 23	4 17.5	+1.3348	+1.2796	+7.45	+0.8721
	17	0.7961	48.33	3.222	14 23	0 57.6	63 20	4 13.3	1.3364	1.2801	7.39	0.8687
	18	0.7988	48.50	3.233	14 20	0 57.4	62 17	4 9.1	1.3378	1.2806	7.33	0.8652
	19	0.8015	48.64	3.243	14 16	0 57.1	61 15	4 4.9	1.3390	1.2812	7.27	0.8615
(2^{h}.0)	20	0.8043	48.76	3.251	14 12	0 56.8	60 12	4 0.8	1.3398	1.2817	7.21	0.8577
	21	0.8070	+48.83	+3.256	14 8	0 56.5	59 9	3 56.6	+1.3404	+1.2823	+7.14	+0.8536
	22	0.8098	48.88	3.258	14 7	0 56.4	58 7	3 52.5	1.3408	1.2829	7.07	0.8493
	23	0.8125	48.91	3.261	14 8	0 56.5	57 5	3 48.3	1.3411	1.2835	7.00	0.8449
	24	0.8152	48.94	3.262	14 12	0 56.8	56 3	3 44.2	1.3415	1.2841	6.92	0.8403
	25	0.8180	48.99	3.266	14 19	0 57.3	55 1	3 40.0	1.3421	1.2847	6.85	0.8355
	26	0.8207	+49.06	+3.271	14 27	0 57.8	53 59	3 35.9	+1.3430	+1.2853	+6.77	+0.8306
	27	0.8234	49.17	3.278	14 35	0 58.3	52 57	3 31.8	1.3442	1.2860	6.69	0.8254
	28	0.8262	49.32	3.288	14 41	0 58.8	51 56	3 27.7	1.3458	1.2866	6.61	0.8201
	29	0.8289	49.49	3.301	14 46	0 59.1	50 54	3 23.6	1.3475	1.2873	6.52	0.8146
	30	0.8317	49.68	3.312	14 48	0 59.2	49 53	3 19.5	1.3492	1.2879	6.44	0.8088
	31	0.8344	+49.87	+3.324	14 47	0 59.1	48 52	3 15.5	+1.3506	+1.2885	+6.35	+0.8029
Nov.	1	0.8371	50.04	3.335	14 44	0 58.9	47 51	3 11.4	1.3522	1.2892	6.26	0.7967
	2	0.8399	50.17	3.345	14 40	0 58.7	46 50	3 7.3	1.3532	1.2898	6.17	0.7903
	3	0.8426	50.27	3.351	14 36	0 58.4	45 50	3 3.3	1.3539	1.2905	6.07	0.7837
	4	0.8454	50.33	3.355	14 34	0 58.3	44 49	2 59.3	1.3543	1.2912	5.98	0.7768
(3^{h}.0)	5	0.8481	+50.36	+3.357	14 34	0 58.3	43 49	2 55.2	+1.3546	+1.2918	+5.88	+0.7696
	6	0.8508	50.38	3.359	14 37	0 58.5	42 49	2 51.2	1.3548	1.2925	5.78	0.7622
	7	0.8536	50.40	3.360	14 42	0 58.8	41 49	2 47.3	1.3552	1.2931	5.68	0.7546
	8	0.8563	50.45	3.363	14 50	0 59.3	40 49	2 43.2	1.3559	1.2938	5.58	0.7466
	9	0.8590	50.53	3.369	14 58	0 59.8	39 49	2 39.3	1.3569	1.2944	5.47	0.7384
	10	0.8618	+50.66	+3.377	15 5	1 0.3	38 49	2 35.3	+1.3582	+1.2951	+5.37	+0.7299
	11	0.8645	50.83	3.387	15 11	1 0.7	37 50	2 31.3	1.3598	1.2957	5.26	0.7210
	12	0.8673	51.02	3.401	15 14	1 0.9	36 51	2 27.4	1.3616	1.2964	5.15	0.7118
	13	0.8700	51.23	3.415	15 15	1 1.0	35 52	2 23.4	1.3634	1.2970	5.04	0.7022
	14	0.8727	51.44	3.430	15 12	1 0.8	34 53	2 19.5	1.3651	1.2976	4.92	0.6923
	15	0.8755	+51.63	+3.443	15 9	1 0.6	33 54	2 15.6	+1.3666	+1.2982	+4.81	+0.6820
	16	0.8782	+51.79	+3.452	15 4	1 0.3	32 55	2 11.7	+1.3678	+1.2989	+4.69	+0.6713

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		r	f		G		H		Log g.	Log h.	i	Log i.
			In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	″	s	° ′	h m	° ′	h m			″	
Nov.	16	0.8782	+51.79	+3.452	15 4	1 0.3	32 55	2 11.7	+1.3678	+1.2989	+4.69	+0.6713
	17	0.8809	51.92	3.461	15 0	1 0.0	31 56	2 7.8	1.3687	1.2995	4.57	0.6602
	18	0.8837	52.01	3.467	14 57	0 59.8	30 58	2 3.9	1.3694	1.3000	4.45	0.6487
	19	0.8864	52.09	3.472	14 57	0 59.8	30 0	2 0.0	1.3700	1.3006	4.33	0.6368
$(4^{h}.0)$	20	0.8892	52.15	3.477	15 0	1 0.0	29 2	1 56.1	1.3706	1.3012	4.21	0.6243
	21	0.8919	+52.23	+3.482	15 5	1 0.3	28 4	1 52.2	+1.3714	+1.3017	+4.09	+0.6114
	22	0.8946	52.33	3.490	15 11	1 0.7	27 6	1 48.3	1.3725	1.3023	3.96	0.5979
	23	0.8974	52.47	3.498	15 17	1 1.2	26 8	1 44.5	1.3739	1.3028	3.84	0.5839
	24	0.9001	52.64	3.510	15 23	1 1.5	25 10	1 40.7	1.3755	1.3033	3.71	0.5693
	25	0.9029	52.85	3.523	15 27	1 1.8	24 12	1 36.8	1.3773	1.3038	3.58	0.5540
	26	0.9056	+53.07	+3.539	15 28	1 1.9	23 15	1 33.0	+1.3793	+1.3043	+3.45	+0.5381
	27	0.9083	53.30	3.553	15 27	1 1.8	22 18	1 29.2	1.3811	1.3048	3.32	0.5213
	28	0.9111	53.52	3.567	15 23	1 1.6	21 21	1 25.3	1.3827	1.3053	3.19	0.5037
	29	0.9138	53.70	3.580	15 18	1 1.2	20 24	1 21.5	1.3840	1.3057	3.06	0.4852
	30	0.9165	53.85	3.590	15 13	1 0.9	19 27	1 17.7	1.3850	1.3061	2.92	0 4657
Dec.	1	0.9193	+53.96	+3.597	15 9	1 0.6	18 30	1 14.0	+1.3857	+1.3065	+2.79	+0.4150
	2	0.9220	54.03	3.602	15 7	1 0.5	17 33	1 10.2	1.3862	1.3069	2.65	0.4233
	3	0.9248	54.09	3.606	15 7	1 0.5	16 36	1 6.4	1.3867	1.3073	2.51	0.4003
	4	0.9275	54.14	3.609	15 10	1 0.6	15 39	1 2.6	1.3872	1.3076	2.38	0.3760
$(5^{h}.0)$	5	0.9302	54.21	3.614	15 14	1 0.9	14 43	0 58.8	1.3880	1.3080	2.24	0.3499
	6	0.9330	+54.32	+3.622	15 20	1 1.3	13 46	0 55.1	+1.3890	+1.3083	+2.10	+0.3221
	7	0.9357	54.46	3.631	15 25	1 1.7	12 50	0 51.3	1.3903	1.3086	1 96	0.2921
	8	0.9384	54.65	3.643	15 29	1 1.9	11 53	0 47.5	1.3920	1.3089	1.82	0.2597
	9	0.9412	54.87	3.658	15 31	1 2.1	10 57	0 43.8	1.3938	1.3091	1.68	0.2247
	10	0.9439	55.11	3.673	15 30	1 2.0	10 0	0 40.0	1.3956	1.3093	1.54	0.1864
	11	0.9467	+55.34	+3.690	15 27	1 1.8	9 4	0 36.3	+1.3974	+1.3096	+1.39	+0.1441
	12	0.9494	55.57	3.705	15 21	1 1.4	8 8	0 32.5	1.3990	1.3098	1.25	0.0972
	13	0.9521	55.77	3.718	15 15	1 1.0	7 12	0 28.8	1.4003	1.3099	1.11	0.0444
	14	0.9549	55.93	3.729	15 9	1 0.6	6 15	0 25.0	1.4014	1.3101	0.96	9.9839
	15	0.9576	56.06	3.737	15 4	1 0.2	5 19	0 21.3	1.4022	1.3103	0.82	9.9136
	16	0.9603	+56.16	+3.744	15 0	1 0.0	4 23	0 17.5	+1.4029	+1.3104	+0.68	+9.8293
	17	0.9631	56.26	3.751	15 0	1 0.0	3 27	0 13.8	1.4036	1.3104	0.52	9.7239
	18	0.9658	56.35	3.756	15 1	1 0.1	2 31	0 10.0	1.4043	1.3105	0.38	9.5835
	19	0.9686	56.46	3.764	15 4	1 0.3	1 35	0 6.3	1.4053	1.3105	0.24	9.3802
$(6^{h}.0)$	20	0.9713	56.61	3.775	15 8	1 0 5	0 39	0 2.6	1.4066	1.3106	+0.10	+9.0000
	21	0.9740	+56.79	+3.786	15 11	1 0.7	359 43	23 58.9	+1.4081	+1.3106	−0.05	−8.6990
	22	0.9768	57.01	3.801	15 13	1 0.9	358 47	23 55.1	1.4098	1.3106	0.19	9.2788
	23	0.9795	57.25	3.817	15 13	1 0.8	357 51	23 51.4	1.4116	1.3105	0.33	9.5185
	24	0.9823	57.49	3.833	15 10	1 0.6	356 55	23 47.6	1.4134	1.3105	0.47	9.6750
	25	0.9850	57.73	3.848	15 5	1 0.3	355 58	23 43.9	1.4150	1.3104	0.62	9.7914
	26	0.9877	+57.94	+3.862	14 58	0 59.9	355 2	23 40.1	+1.4163	+1.3103	−0.76	−9.8828
	27	0.9905	58.11	3.874	14 51	0 59.4	354 6	23 36.4	1.4173	1.3102	0.91	9.9581
	28	0.9932	58.24	3.882	14 44	0 58.9	353 10	23 32.7	1.4181	1.3100	1.05	0.0221
	29	0.9959	58.33	3.889	14 39	0 58.6	352 14	23 28.9	1.4186	1.3099	1.20	0.0777
	30	0.9987	58.40	3.893	14 36	0 58.4	351 17	23 25.1	1.4190	1.3097	1.34	0.1269
	31	1.0014	+58.46	+3.898	14 35	0 58.3	350 21	23 21.4	+1.4194	+1.3095	−1.48	−0.1709
	32	1.0042	+58.53	+3.902	14 36	0 58.4	349 25	23 17.6	+1.4200	+1.3093	−1.63	−0.2107

MEAN PLACES FOR 1882.0. (January $-0^{d}.258$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
α Andromedæ	2.0	0 2 17.389	+ 3.0901	+ 28 26 19.99	+ 19.886
* β Cassiopeæ	2.0	0 2 53.218	3.1701	+ 58 29 55.00	19.853
* 22 Andromedæ	5.3	0 4 11.470	3.2998	+ 45 24 55.40	20.037
4 Draconis (H.) . S. P.	4.7	0 6 39.670	2.8951	+101 43 40.84	20.024
γ Pegasi (*Algenib*)	2.7	0 7 9.621	3.0830	+ 14 31 38.85	20.026
* σ Andromedæ	4.3	0 12 9.942	+ 3.1212	+ 35 7 51.07	+ 19.985
* ι Ceti	3.3	0 13 24.805	3.0530	− 9 28 42.17	19.959
* 6 Ursæ Minoris . S. P.	6.0	0 14 19.460	0.0810	+ 91 38 45.04	19.941
* 44 Piscium	6.0	0 19 21.226	3.0729	+ 1 17 9.99	19.956
β Hydri	3.0	0 19 31.655	3.2425	− 77 55 8.08	20.288
12 Ceti	6.0	0 24 1.000	+ 3.0610	− 4 36 33.99	+ 19.942
κ Draconis . S. P.	3.3	0 28 26.476	2.5958	+109 33 40.42	19.894
* π Andromedæ	4.0	0 30 34.818	3.1888	+ 33 4 10.15	19.877
α Cassiopeæ (*var.*)	2.5	0 33 49.075	3.3696	+ 55 53 23.69	19.794
β Ceti	2.0	0 37 39.976	3.0147	− 18 38 4.55	19.808
21 Cassiopeæ	6.0	0 37 52.405	+ 3.8455	+ 74 20 34.02	+ 19.759
* υ Cassiopeæ	5.0	0 38 9.203	3.3161	+ 47 38 17.69	19.761
* δ Piscium	4.3	0 42 33.632	3 1068	+ 6 56 33.25	19.656
32² Camelop. (H.) . S. P.	4.7	0 48 16.375	0.3767	+ 95 56 44.47	19.598
* γ Cassiopeæ	2.0	0 49 35.668	3.5736	+ 60 4 38.41	19.569
* μ Andromedæ	4.0	0 50 12.375	+ 3.3088	+ 37 51 32.53	+ 19.626
* 43 Cephei (H.)	4.3	0 52 50.700	7.1325	+ 85 37 23.92	19.522
ε Piscium	4.0	0 56 49.169	3.1085	+ 7 15 16.21	19.464
β Andromedæ	2.3	1 3 7.680	3.3422	+ 34 59 40.36	19.175
* *f* Piscium	5.0	1 11 42.746	3.0891	+ 2 59 33.42	19.045
* κ Tucanæ	5.0	1 11 45.964	+ 2.0566	− 69 30 10.54	+ 19.180
α Ursæ Minoris (*Polaris*)	2.0	1 15 30.032	21.9650	+ 88 40 46.94	18.975
θ¹ Ceti	3.0	1 18 7.513	2.9969	− 8 47 33.54	18.680
38 Cassiopeæ	6.3	1 22 27.946	4.3670	+ 69 39 23.80	18.693
η Piscium	3.7	1 25 10.208	3 2015	+ 14 44 13.43	18.677
* υ Andromedæ	4.0	1 29 52.501	+ 3.5016	+ 40 48 53.35	+ 18.161
* π Piscium	5.7	1 30 50.644	3.1696	+ 11 32 15.10	18.540
α Eridani (*Achernar*)	1.0	1 33 18.833	2.2332	− 57 50 11.70	18.367
* ν Piscium	4.7	1 35 17.470	3.1172	+ 4 53 23.92	18.344
ο Piscium	4.3	1 39 9.800	3.1614	+ 8 33 47.49	18.232
* ζ Ceti	3.0	1 45 38.153	+ 2.9616	− 10 55 9.60	+ 17.840
β Arietis	3.0	1 48 7.366	3.3022	+ 20 13 50.20	17.744
50 Cassiopeæ	4.0	1 53 22.804	4.9971	+ 71 50 57.63	17.673
* γ Andromedæ	2.3	1 56 39.575	3.6575	+ 41 45 45.79	17.463
α Arietis	2.0	2 0 31.385	3.3695	+ 22 54 13.58	17.192
α Draconis . S. P.	3.3	2 1 11.742	+ 1.6234	+115 3 35.86	+ 17.308
* β Trianguli	3.0	2 2 31.502	3.5523	+ 34 25 42.15	17.225
ξ¹ Ceti	4.3	2 6 44.797	+ 3.1731	+ 8 17 32.95	17.049
* 4 Ursæ Minoris . S. P.	5.0	2 9 19.646	− 0.3342	+101 53 52.69	16.909
* γ Trianguli	4.3	2 10 18.067	+ 3.5488	+ 33 18 2.35	16.866
* 67 Ceti	6.0	2 11 5.856	+ 2.9890	− 6 58 0.09	+ 16.751
ι Cassiopeæ	4.0	2 19 21.289	4.8524	+ 66 52 14.62	16.464
* δ Hydri	4.0	2 19 39.185	1.0526	− 69 11 47.58	16.458
ξ² Ceti	4.0	2 21 53.171	+ 3.1828	+ 7 55 49.30	16.317
5 Ursæ Minoris . S. P.	4.7	2 27 47.353	− 0.1991	+103 46 46.06	+ 16.011

*Apparent places of stars marked with an asterisk are not given in this Ephemeris.

MEAN PLACES FOR 1882.0. (January $-0^{d}.258$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* δ Ceti	4.0	2 33 26.089	+ 3.0722	− 0 10 53.29	+ 15.718
* μ Hydri . . : . .	6.0	2 34 12.095	− 1.4548	− 79 37 25.66	15.672
* θ Persei	4.0	2 36 8.724	+ 4.0660	+ 48 43 41.67	15.486
γ² Ceti	3.3	2 37 11.203	+ 3.1026	+ 2 44 15.76	15.361
* σ Arietis	5.7	2 44 58.728	+ 3.3034	+ 14 35 41.62	15.033
* 47 Cephei (H.) . . .	6.0	2 50 27.181	+ 7.6879	+ 78 57 0.42	+ 14.753
β Ursæ Minoris . . S. P.	2.0	2 51 3.702	− 0.2386	+105 21 44.20	14.718
* ε Arietis	4.3	2 52 27.965	+ 3.4197	+ 20 52 2.97	14.632
α Ceti	2.3	2 56 6.699	+ 3.1296	+ 3 37 33.29	14.333
* β Persei (*Algol*) (*var.*)	2.7	3 0 29.635	+ 3.8810	+ 40 29 59.25	14.151
48 Cephei (H.) . . .	6.3	3 5 23.541	+ 7.3805	+ 77 17 55.91	+ 13.790
ζ Arietis	4.7	3 8 7.205	+ 3.4381	+ 20 36 22.04	13.585
α Persei	2.0	3 15 54.214	+ 4.2540	+ 49 26 23.45	13.129
* ι Hydri	5.0	3 18 55.510	− 1.6131	− 77 49 7.58	13.013
γ² Ursæ Minoris . . S. P.	3.0	3 20 55.500	− 0.1392	+107 44 46.05	12.810
* *f* Tauri	4.0	3 24 21.529	+ 3.3040	+ 12 31 52.60	+ 12.592
ε Eridani	3.0	3 27 22.272	+ 2.8232	− 9 51 30.24	12.418
δ Persei	3.3	3 34 31.662	+ 4.2469	+ 47 24 31.55	11.847
* γ Camelopardalis (H.).	4.3	3 37 55.258	+ 6.2265	+ 70 57 59.45	11.605
η Tauri	3.0	3 40 28.260	+ 3.5556	+ 23 44 20.53	11.412
ζ Persei	3.0	3 46 42.979	+ 3.7585	+ 31 31 54.57	+ 10.985
ζ Ursæ Minoris . . S. P.	4.3	3 48 18.008	− 2.2664	+101 50 35.47	10.901
* γ Hydri	3.3	3 49 4.760	− 1.0048	− 74 36 1.06	10.972
* ε Persei	3.3	3 49 56.223	+ 4.0078	+ 39 40 2.63	10.760
γ Eridani	3.0	3 52 31.483	+ 2.7981	− 13 50 42.61	10.472
* A¹ Tauri	4.7	3 57 43.221	+ 3.5388	+ 21 45 29.04	+ 10.117
* *c* Persei	4.0	4 0 5.881	+ 4.3344	+ 47 23 45.07	9.982
Groombr. 2320 . S. P.	6.3	4 6 0.076	+ 0.1368	+111 52 43.87	9.500
* ο¹ Eridani	4.3	4 6 6.338	+ 2.9263	− 7 8 47.04	9.645
γ Tauri	4.0	4 13 4.740	+ 3.4081	+ 15 20 29.28	8.992
* η Ursæ Minoris . . S. P.	5.0	4 20 58.036	− 1.8249	+103 58 23.80	+ 8.144
ε Tauri	3.7	4 21 43.612	+ 3.4965	+ 18 55 2.61	8.293
η Draconis . . . S. P.	2.7	4 22 23.810	+ 0.8050	+118 13 6.52	8.229
* *m* Persei	6.0	4 25 6.874	+ 4.2082	+ 42 48 36.62	8.048
* δ Mensæ	6.0	4 25 59.543	− 4.2453	− 80 29 19.41	7.993
A Draconis . . . S. P.	5.0	4 28 13.266	− 0.1380	+110 58 36.29	+ 7.797
α Tauri (*Aldebaran*) .	1.0	4 29 9.017	+ 3.4365	+ 16 16 14.76	7.551
* τ Tauri	4.3	4 35 9.798	+ 3.5944	+ 22 43 44.84	7.223
α Camelopardalis . .	4.7	4 42 19.435	+ 5.9200	+ 66 8 23.59	6.666
* *i* Tauri	5.3	4 44 28.305	+ 3.5046	+ 18 38 15.36	6.444
ι Aurigæ	3.0	4 49 18.614	+ 3.8996	+ 32 58 39.88	+ 6.066
* ζ Aurigæ	4.0	4 54 13.867	+ 4.1838	+ 40 54 6.90	5.670
11 Orionis	5.0	4 57 49.586	+ 3.4238	+ 15 14 18.16	5.335
ε Ursæ Minoris . . S. P.	4.3	4 58 6.349	− 6.3546	+ 97 46 14.76	5.353
* β Eridani	3.0	5 2 2.928	+ 2.9482	− 5 14 24.58	4.959
α Aurigæ (*Capella*) .	1.0	5 7 58.397	+ 4.4235	+ 45 52 34.26	+ 4.078
β Orionis (*Rigel*) . .	1.0	5 8 52.029	+ 2.8810	− 8 20 20.84	4.431
* τ Orionis	4.0	5 11 52.607	+ 2.9122	− 6 58 23.64	4.169
β Tauri	2.0	5 18 49.984	+ 3.7887	+ 28 30 22.44	3.402
Groombridge 966 . .	6.3	5 23 57.570	+ 7.9953	+ 74 57 44.80	+ 3.160

*Apparent places of stars marked with an asterisk are not given in this Ephemeris.

MEAN PLACES FOR 1882.0. (January $-0^d.258$, Washington.)

	Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
*	Groombridge 944	6.3	5	24	19.300	+18.6060	+85	7	58.43	+3.121
*	χ Aurigæ	5.0	5	25	2.941	+3.9044	+32	6	12.36	3.067
	δ Orionis (*var.*)	2.5	5	25	58.703	+3.0631	−0	23	15.87	2.961
	α Leporis	3.0	5	27	31.561	+2.6446	−17	54	28.15	2.831
	ε Orionis	2.0	5	30	13.555	+3.0421	−1	16	42.64	2.598
	α Columbæ	2.0	5	35	22.631	+2.1726	−34	8	16.40	+2.105
	ω Draconis . . . S. P.	5.0	5	37	38.636	−0.3546	+111	11	15.65	1.629
*	κ Orionis	2.7	5	42	9.583	+2.8447	−9	42	45.82	1.563
*	ν Aurigæ	4.0	5	43	18.686	+4.1552	+39	6	43.71	1.495
	ψ^1 Draconis . . . S. P.	4.3	5	44	2.316	−1.0805	+107	47	37.39	1.668
*	δ Doradus	4.3	5	44	33.915	+0.1048	−65	46	46.80	+1.330
	α Orionis (*var.*)	1.2	5	48	47.010	+3.2469	+7	23	1.37	0.988
*	β Aurigæ	2.0	5	50	52.399	+4.4014	+44	56	0.88	0.788
*	θ Aurigæ	3.0	5	51	40.521	+4.0918	+37	12	9.72	+0.640
	ν Orionis	4.7	6	0	50.125	+3 4272	+14	46	52.13	−0.104
	22 Camelopardalis (H.)	4.7	6	5	50.261	+6.6181	+69	21	30.92	−0.629
*	η Geminorum	3.3	6	7	45.317	+3.6227	+22	32	22.47	0.695
	δ Ursæ Minoris . . S. P.	4.3	6	10	23.290	−19.4440	+93	23	25.01	0.960
*	ψ^1 Aurigæ	5.3	6	15	48.604	+4.6268	+49	20	46.47	1.392
	μ Geminorum	3.0	6	15	49.322	+3.6315	+22	34	21.51	1.506
	α Argus (*Canopus*)	1.0	6	21	20.044	+1.3303	−52	37	53.78	−1.855
*	ν Geminorum	4.7	6	21	57.385	+3.5631	+20	17	7.33	1.940
*	χ Draconis . . . S. P.	4.0	6	23	10.970	−1.0790	+107	19	7.67	1.648
	γ Geminorum	2.3	6	30	53.703	+3.4675	+16	29	55.01	2.743
*	ε Geminorum	3.3	6	36	40.298	+3.6936	+25	14	47.42	3.209
*	ψ^5 Aurigæ	5.7	6	38	13.942	+4.3296	+43	41	35.40	−3.182
†	α Canis Majoris (*Sirius*)	1.0	6	39	56.909	+2.6437	−16	33	19.12	4.684
	51 Cephei (H.)	5.3	6	44	45.537	+30.0810	+87	13	37.52	3.984
*	θ Geminorum	3.3	6	45	0.685	+3.9611	+34	6	7.30	3.945
*	ζ Mensæ	5.8	6	49	50.660	−4.8903	−80	41	13.58	4.251
	50 Draconis . . . S. P.	6.0	6	50	10.306	−1.9039	+104	42	21.26	−4.430
	ε Canis Majoris	1.7	6	53	59.327	+2.3576	−28	48	44.90	4.693
*	ζ Geminorum (*var.*)	4.0	6	57	6.802	+3.6528	+20	44	31.08	4.964
*	63 Aurigæ	5.0	7	3	32.267	+4.1375	+39	30	41.57	5.470
	δ Canis Majoris	2.0	7	3	35.609	+2.4384	−26	12	24.11	5.485
*	25 Camelopardalis	4.7	7	6	10.840	+12.9960	+82	38	2 93	−5.741
*	γ^2 Volantis (*var.*)	4 7	7	9	44.794	−0.4840	−70	18	24.43	5.890
	δ Draconis . . . S. P.	3.0	7	12	31.497	+0.0312	+112	32	45.67	6.326
	δ Geminorum	3.3	7	13	4.514	+3.5885	+22	11	53.60	6.303
	τ Draconis . . . S. P.	4.7	7	17	48.941	−1.1128	+106	51	50.39	6.788
	Piazzi vii. 67	6.0	7	18	35.577	+6.3049	+68	42	15.85	−6.780
*	β Canis Minoris	3.0	7	20	45.075	+3.2600	+8	31	32.89	6.958
	α^2 Geminorum (*Castor*)	1.7	7	27	4.221	+3.8393	+32	8	45.42	7.515
†	α Canis Min. (*Procyon*)	1.0	7	33	7.473	+3.1439	+5	31	34.59	8.963
	β Geminorum (*Pollux*)	1.3	7	38	5.659	+3.6801	+28	18	35.65	8.381
	λ Ursæ Minoris . . S. P.	6.3	7	42	5.828	−62.7340	+91	3	5.96	−8.652
*	Groombridge 1374	5.7	7	46	2.659	+7.2992	+74	13	49.95	8.984
*	26 Lyncis	6.0	7	46	6.985	+4.3905	+47	52	7.99	8.977
	φ Geminorum	5.0	7	46	16.481	+3.6809	+27	4	11.89	8.995
	ε Draconis . . . S. P.	3.7	7	48	33.877	−0.1760	+110	1	57.39	−9.176

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† Periodic corrections given in Appendix I are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1882.0. (January $-0^{\rm d}.258$, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
* ω^1 Cancri	6.0	7	53	47.448	+ 3.6382	+ 25	42	53.02	− 9.544
3 Ursæ Majoris (H.)	5.7	8	1	3.407	+ 6.0579	+ 68	49	9.66	10.104
15 Argus (ι)	3.0	8	2	31.135	+ 2.5543	− 23	57	53.84	10.172
* ζ^1 Cancri	4.7	8	5	26.624	+ 3.4472	+ 18	0	6.85	10.572
* β Cancri	3.7	8	10	6.910	+ 3.2591	+ 9	32	52.82	10.827
κ Cephei (*pr.*) S. P.	4.3	8	12	50.297	− 1.9109	+102	38	40.43	− 11.012
* 30 Monocerotis	3.7	8	19	45.821	+ 3.0002	− 3	31	20.78	11.480
* θ Chamæleontis	4.7	8	24	9.262	− 1.6981	− 77	6	11.40	11.776
η Cancri	5.7	8	25	53.064	+ 3.4793	+ 20	50	27.39	11.973
Groombr. 3241 S. P.	6.3	8	30	30.401	− 0.2149	+107	52	5.43	12.223
* σ Hydræ	5.0	8	32	35.379	+ 3.1463	+ 3	45	16.97	− 12.407
* γ Cancri	4.3	8	36	27.383	+ 3.4815	+ 21	53	30.38	12.696
ε Hydræ	3.3	8	40	31.612	+ 3.1823	+ 6	51	2.82	12.979
* σ^2 Cancri (*mean*)	5.7	8	47	2.587	+ 3.6751	+ 31	1	30.85	13.378
ι Ursæ Majoris	3.0	8	51	7.387	+ 4.1366	+ 48	30	13.87	13.873
12 Year Cat. 1879 S. P.	6.0	8	52	53.957	− 2.5258	+ 99	53	27.70	− 13.704
σ^2 Ursæ Majoris	5.0	8	59	59.637	+ 5.3648	+ 67	36	43.82	14.235
κ Cancri	5.0	9	1	21.340	+ 3.2565	+ 11	8	32.12	14.267
* θ Hydræ	4.0	9	8	13.498	+ 3.1266	+ 2	48	40.46	14.995
* β Argus	1.5	9	11	53.982	+ 0.6800	− 69	13	52.40	14.798
* α Lyncis	3.3	9	13	51.789	+ 3.6707	+ 34	53	25.58	− 15.001
ι Argus	2.0	9	13	55.765	+ 1.6014	− 58	46	48.65	14.987
α Cephei S. P.	2.7	9	15	45.762	+ 1.4371	+117	54	50.89	15.163
1 Draconis (H.)	4.3	9	20	9.558	+ 9.0576	+ 81	50	45.31	15.389
α Hydræ	2.0	9	21	47.331	+ 2.9492	− 8	8	52.26	15.432
d Ursæ Majoris	4.7	9	24	1.471	+ 5.4136	+ 70	20	51.69	− 15.527
θ Ursæ Majoris	3.0	9	24	57.453	+ 4.0451	+ 52	12	50 98	16.193
* 10 Leonis Minoris	4.7	9	26	59.510	+ 3.6963	+ 36	55	14.21	15.759
β Cephei (*pr.*) S. P.	3.0	9	27	7.943	+ 0.7966	+109	57	25.95	15.751
* υ Leonis	3.7	9	34	51.124	+ 3.2076	+ 10	25	42.30	16.202
* ζ Chamæleontis	5.0	9	37	18.797	− 1.5413	− 80	24	38.60	− 16.304
ε Leonis	3.0	9	39	9.106	+ 3.4164	+ 24	19	0.63	16.406
11 Cephei S. P.	5.0	9	40	11.414	+ 0.9036	+109	13	54.23	16.533
μ Leonis	4.0	9	46	3.058	+ 3.4235	+ 26	33	43.24	16.777
* 19 Leonis Minoris	5.3	9	50	27.232	+ 3.6980	+ 41	37	0.48	16.942
79 Draconis S. P.	6.3	9	51	23.790	+ 0.7326	+106	51	21.03	− 17.010
* π Leonis	5.0	9	53	58.632	+ 3.1749	+ 8	36	34.99	17.123
α Leonis (*Regulus*)	1.3	10	2	5.221	+ 3.2014	+ 12	32	36.11	17.458
32 Ursæ Majoris	6.0	10	9	27.049	+ 4.4293	+ 65	41	46.13	17.791
* λ Ursæ Majoris	3.3	10	9	58.554	+ 3.6424	+ 43	30	10.10	17.856
γ^1 Leonis	2.0	10	13	27.947	+ 3.3160	+ 20	26	16.40	− 18.071
* μ Hydræ	4.0	10	20	23.067	+ 2.9004	− 16	14	4.55	18.298
* β Leonis Minoris	4.3	10	21	3.419	+ 3.4888	+ 37	18	40 85	18.300
* α Antliæ	4.0	10	21	45.167	+ 2.7384	− 30	28	4.11	18.206
9 Draconis (H.)	4.7	10	25	2.086	+ 5.2834	+ 76	19	12.19	18.372
ρ Leonis	4.0	10	26	35.868	+ 3.1647	+ 9	54	47.97	− 18.419
226 Cephei (B.) S. P.	5.3	10	30	11.908	+ 1 0799	+104	22	53.85	18.525
* 41 Leonis Minoris	5.7	10	36	59.913	+ 3.2720	+ 23	48	20.57	18.727
η Argus (*var.*)	1—6	10	40	29.088	+ 2.3118	− 59	3	51.77	18.863
l Leonis	5.3	10	43	3.274	+ 3.1591	+ 11	10	9.17	− 18.963

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MEAN PLACES FOR 1882.0. (January $-0^{d}.258$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* δ^2 Chamæleontis	5.0	10 44 39.440	+ 0.6149	− 79 55 4.70	−19.000
ι Cephei . . . . S. P.	3.3	10 45 28.833	2.1201	+114 25 12.34	18.870
* 46 Leonis Minoris	4.0	10 46 42.597	3.3715	+ 34 51 2.81	19.285
* Groombridge 1706	6.0	10 50 28.498	4.9934	+ 78 24 6.86	19.166
α Ursæ Majoris	2.0	10 56 26.138	+ 3.7535	+ 62 23 15.87	19.354
* η Octantis	6.0	11 0 5.422	− 0.2724	− 83 57 33.27	− 19.410
* p^3 Leonis	6.0	11 0 53.072	+ 3.0622	+ 2 35 44.33	19.480
* ψ Ursæ Majoris	3.3	11 3 1.514	3.3961	+ 45 8 17.62	19.496
δ Leonis	2.3	11 7 49.912	3.1992	+ 21 10 11.88	19.678
* ν Ursæ Majoris	3.3	11 12 6.286	3.2593	+ 33 44 16.64	19.567
δ Crateris	3.3	11 13 26.526	+ 2.9958	− 14 8 24.91	− 19.458
ο Cephei . . . . S. P.	5.3	11 13 47.126	2.4409	+112 32 2.11	19.665
τ Leonis	5.0	11 21 52.125	3.0863	+ 3 30 21.37	19.798
λ Draconis	3.3	11 24 22.996	3.6296	+ 69 58 55.83	19.832
* ξ Hydræ	4.0	11 27 11.943	2.9417	− 31 11 57.87	19.882
υ Leonis	5.0	11 30 54.432	+ 3.0712	− 0 10 20.72	− 19.858
γ Cephei . . . . S. P.	3.3	11 34 30.662	2.4099	+103 1 34.62	20.074
* χ Ursæ Majoris	3.7	11 39 48.944	3.1931	+ 48 26 0.94	19.960
β Leonis	2.0	11 43 2.417	3.0647	+ 15 13 53.80	20.117
γ Ursæ Majoris	2.3	11 47 37.198	3.1850	+ 54 21 2.67	20.026
Groombr. 4163 . S. P.	7.0	11 49 6.314	+ 2.8584	+106 14 46.82	− 20.022
* π Virginis	4.3	11 54 49.550	3.0753	+ 7 16 20.32	20.088
ο Virginis	4.0	11 59 11.878	3.0578	+ 9 23 18.26	20.016
* ε Corvi	3.0	12 4 3.520	3.0786	− 21 57 49.45	20.042
4 Draconis (H.)	4.7	12 6 39.670	2.8951	+ 78 16 19.16	20.024
γ Corvi	2.0	12 9 44.333	+ 3.0786	− 16 53 12.05	− 20.020
* 2 Canum Venaticorum	5.3	12 10 12.642	3.0237	+ 41 19 0.60	20.068
β Chamæleontis	5.0	12 11 27.132	3.3866	− 78 39 24.40	20.000
η Virginis	3.3	12 13 52.152	3.0685	− 0 0 39.57	20.044
* 6 Ursæ Minoris	6.0	12 14 19.460	0.0810	+ 88 21 14.96	19.941
α^1 Crucis	1.0	12 20 1.921	+ 3.2726	− 62 26 41.91	− 20.018
* δ^2 Corvi	2.3	12 23 45.673	3.1016	− 15 51 29.32	20.089
* β Canum Venaticorum	4.3	12 28 8.234	2.8610	+ 41 59 55.63	19.620
β Corvi	2.3	12 28 11.419	3.1404	− 22 44 38.54	19.968
κ Draconis	3.3	12 28 26.476	2.5958	+ 70 26 19.58	19.894
* γ Virginis (*mean*)	2.7	12 35 40.906	+ 3.0380	− 0 48 7.88	− 19.817
21 Cassiopeæ . . . S. P.	6.0	12 37 52.405	3.8455	+105 39 25.98	19.759
* 31 Coronæ Borealis	5.0	12 45 57.081	2.9309	+ 28 10 58.59	19.668
32^2 Camelopardalis (H.)	4.7	12 48 16.375	0.3767	+ 84 3 15.53	19.598
* γ Cassiopeæ . . . S. P.	2.0	12 49 35.668	3.5736	+119 55 21.59	19.569
α^2 Canum Venaticorum	2.7	12 50 30.434	+ 2.8166	+ 38 57 21.06	− 19.520
* 43 Cephei (H.) . . S. P.	4.3	12 52 50.700	7.1325	+ 94 22 36.08	19.522
* δ Muscæ	4.0	12 54 10.385	4.0228	− 70 54 42.25	19.484
* ε Virginis	2.7	12 56 18.199	2.9880	+ 11 35 36.98	19.426
θ Virginis	4.3	13 3 50.443	3.1006	− 4 54 31.39	19.322
* 20 Canum Venaticorum	4.7	13 12 15.021	+ 2.6977	+ 41 11 38.81	− 19.045
α Urs. Min. (*Polaris*) S. P.	2.0	13 15 30.032	21.9650	+ 91 19 13.06	18.975
α Virginis (*Spica*)	1.0	13 18 58.639	3.1527	− 10 32 42.11	18.913
* κ Octantis	5.0	13 22 5.642	8.5550	− 85 10 47.30	18.814
38 Cassiopeæ . . . S. P.	6.3	13 22 27.946	+ 4.3670	+110 20 36.20	− 18.693

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MEAN PLACES FOR 1882.0. (January $-0^{d}.258$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
ζ Virginis	3.3	13 28 40.852	+ 3.0526	+ 0 0 28.37	− 18.532
* B. A. C. 4536 . . .	5.0	13 29 31.607	+ 2.6830	+ 37 47 14.17	18.551
* m Virginis	6.0	13 35 25.175	+ 3.1424	− 8 6 25.34	18.304
η Ursæ Majoris . . .	2.0	13 42 53.438	+ 2.3720	+ 49 54 9.13	18.091
η Bootis	3 0	13 49 3.984	+ 2.8568	+ 18 59 23.06	18.187
50 Cassiopeæ . . . S. P.	4.0	13 53 22.804	+ 4.9971	+108 9 2.37	− 17.673
* θ Apodis	5.0	13 53 52.522	+ 5.6522	− 76 13 32.66	17.622
β Centauri	1.0	13 55 30.254	+ 4.1715	− 59 48 10.50	17.614
* π Hydræ	3.7	13 59 39.324	+ 3.4062	− 26 6 48.34	17.523
α Draconis	3.3	14 1 11.742	+ 1.6234	+ 64 56 24.14	17.308
* d Bootis	5.0	14 5 1.063	+ 2.7389	+ 25 39 4.16	− 17.217
* κ Virginis	4.3	14 6 36.140	+ 3.1929	− 9 43 25.93	16.948
* δ Octantis	5.0	14 8 9.801	+ 8.9027	− 83 7 30.20	17.011
* 4 Ursæ Minoris . . .	5.0	14 9 19.646	− 0.3342	+ 78 6 7.31	16.909
α Bootis (*Arcturus*) .	1.0	14 10 16.775	+ 2.7347	+ 19 47 50.23	18.900
* λ Bootis	4.0	14 11 53.845	+ 2.2831	+ 46 37 50.16	− 16.674
* λ Virginis	4.7	14 12 43.567	+ 3.2369	− 12 49 38.21	16.750
ι Cassiopeæ . . . S. P.	4.0	14 19 21.289	+ 4.8524	+113 7 45.38	16.464
θ Bootis	4.0	14 21 10.831	+ 2.0443	+ 52 23 47.65	16.775
ρ Bootis	3.7	14 26 44.722	+ 2.5879	+ 30 53 23.73	15.978
5 Ursæ Minoris . . .	4.7	14 27 47.353	− 0.1991	+ 76 13 13.94	− 16.011
α^2 Centauri	1.0	14 31 36.697	+ 4.0406	− 60 20 59.52	15.401
* α Apodis	4.7	14 33 15.950	+ 7.1501	− 78 32 29.73	15.748
* 33 Bootis	5.3	14 34 26.733	+ 2.2345	+ 44 54 51.17	15.727
ε Bootis	2.3	14 39 50.072	+ 2.6213	+ 27 34 20.25	15.361
α^2 Libræ	2.3	14 44 21.091	+ 3.3084	− 15 33 2.09	− 15.193
* 47 Cephei (H.) . . S. P.	6.0	14 50 27.181	+ 7.6879	+101 2 59.58	14.753
β Ursæ Minoris . . .	2.0	14 51 3.702	− 0.2386	+ 74 38 15.80	14.718
* γ Scorpii	3.3	14 57 9.981	+ 3.5005	− 24 49 1.73	14.384
β Bootis	3.0	14 57 30.097	+ 2.2601	+ 40 51 23.56	14.379
48 Cephei (H.) . . S. P.	6.3	15 5 23.541	+ 7.3805	+102 42 4.09	− 13.790
β Libræ	2.0	15 10 39.482	+ 3.2208	− 8 56 47.83	13.537
* δ Bootis	3 0	15 10 44.759	+ 2,4208	+ 33 45 20.97	13.605
* ρ Octantis	6.0	15 16 17.430	+12.8753	− 84 4 2.82	13.083
μ^1 Bootis	4.0	15 20 1.988	+ 2.2661	+ 37 47 30.07	12.800
γ^2 Ursæ Minoris . . .	3.0	15 20 55.500	− 0.1392	+ 72 15 13.95	− 12.810
* β Coronæ Borealis . .	4.0	15 22 57.857	+ 2.4749	+ 29 30 46.96	12.616
α Coronæ Borealis . .	2.0	15 29 41.541	+ 2.5390	+ 27 6 45.18	12.329
* γ Camelop. (H.) . . S. P.	4.3	15 37 55.258	+ 6.2265	+109 2 0.55	11.605
α Serpentis	2.3	15 38 27.375	+ 2.9511	+ 6 47 51.74	11.579
ε Serpentis	3.3	15 44 56.074	+ 2.9865	+ 4 50 1.99	− 11.078
ζ Ursæ Minoris . . .	4.3	15 48 18.008	− 2.2664	+ 78 9 24.53	10.901
ε Coronæ Borealis . .	4.0	15 52 42.211	+ 2.4830	+ 27 13 13.22	10.636
δ Scorpii	2.3	15 53 21.458	+ 3.5375	− 22 17 4.68	10.562
β^1 Scorpii	2.0	15 58 34.629	+ 3.4797	− 19 28 52.67	10.172
* δ^1 Apodis	5.3	16 2 45.583	+ 8.7310	− 78 23 40.90	− 9.794
* φ Herculis	4.0	16 5 2.984	+ 1.8810	+ 45 14 41.48	9.600
Groombridge 2320 .	6.3	16 6 0.076	+ 0.1368	+ 68 7 16.13	9.500
δ Ophiuchi	3.0	16 8 9.748	+ 3.1391	− 3 23 21.90	9.546
* σ Coronæ Borealis (*mean*)	5.7	16 10 15.536	+ 2.2445	+ 34 9 30.29	− 9.279

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MEAN PLACES FOR 1882.0. (January —0d.258, Washington.)

Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
* γ Apodis		4.3	16 15 23.468	+ 8.9860	— 78 37 41.82	— 8.890
τ Herculis		3.3	16 16 11.681	+ 1.8007	+ 46 35 41.46	8.754
* η Ursæ Minoris . . .		5.0	16 20 58.036	— 1.8249	+ 76 1 36 20	8.144
α Scorpii (*Antares*) .		1.3	16 22 10.410	+ 3.6689	— 26 10 7.67	8.338
η Draconis		2.7	16 22 23.810	+ 0.8050	+ 61 46 53.48	8.229
β Herculis		2.3	16 25 8.857	+ 2.5772	+ 21 44 51.55	— 8.083
A Draconis		5.0	16 28 13.266	— 0.1380	+ 69 1 23.71	7.797
ζ Ophiuchi		2.7	16 30 39.713	+ 3.2985	— 10 19 36.87	7.599
α Trianguli Australis .		2.0	16 36 10.954	+ 6.2932	— 68 48 30.40	7.229
η Herculis		3.3	16 38 51.035	+ 2.0535	+ 39 8 50.53	7.043
α Camelopardalis	. S. P.	4.7	16 42 19.435	+ 5.9200	+113 51 36.41	— 6.666
κ Ophiuchi		3.3	16 52 5.006	+ 2.8371	+ 9 33 34.32	5.862
d Herculis		5.0	16 57 14.995	+ 2.2111	+ 33 44 23.73	5.420
ε Ursæ Minoris . . .		4.3	16 58 6.349	— 6.3546	+ 82 13 45.24	5.353
* η Ophiuchi		2.7	17 3 36.652	+ 3.4364	— 15 34 39.09	4.775
α¹ Herculis (*var.*) . .		3.5	17 9 16.038	+ 2.7333	+ 14 31 33.03	— 4.376
* π Herculis		3.0	17 10 56.261	+ 2.0889	+ 36 56 34.29	4.252
* θ Ophiuchi		3.3	17 14 45.789	+ 3.6786	— 24 52 49.21	3.983
b Ophiuchi (*var.*) . .		5.0	17 19 9.871	+ 3.6584	— 24 3 54.97	3.684
* δ Aræ		4.0	17 20 27.090	+ 5.8995	— 65 35 0.03	3.584
Groombr. 966 .	. S. P.	6.3	17 23 57.570	+ 7.9953	+105 2 15.20	— 3.160
* Groombr. 944 .	. S. P.	6.3	17 24 19.300	+18.6060	+ 94 52 1.57	3.121
β Draconis		2.7	17 27 46.045	+ 1.3530	+ 52 23 20.84	2.812
α Ophiuchi		2.0	17 29 27.437	+ 2.7826	+ 12 38 49.03	2.902
* ι Herculis		3.3	17 36 8.128	+ 1.6964	+ 46 4 10.77	2.096
ω Draconis		5.0	17 37 38.636	— 0.3546	+ 68 48 44.35	— 1.629
μ Herculis		3.3	17 41 50.469	+ 2.3461	+ 27 47 25.66	2.347
ψ¹ Draconis		4.3	17 44 2.316	— 1.0805	+ 72 12 22.61	1.668
* θ Herculis		4.0	17 52 12.369	+ 2.0549	+ 37 16 0.66	0.663
γ Draconis		2.3	17 53 51.982	+ 1.3913	+ 51 30 11.43	0.567
γ² Sagittarii		3.3	17 58 13.676	+ 3.8513	— 30 25 26.29	— 0.374
* ο Herculis		4.0	18 2 56.392	+ 2.3392	+ 28 44 49.39	+ 0.260
22 Camelop. (H.)	. S. P.	4.7	18 5 50.261	+ 6.6181	+110 38 29.08	0.629
μ Sagittarii		4.0	18 6 42.405	+ 3.5865	— 21 5 17.71	0.575
δ Ursæ Minoris . . .		4.3	18 10 23.290	—19.4440	+ 86 36 34.99	0.960
η Serpentis		3.0	18 15 12.257	+ 3.1021	— 2 55 41.04	+ 0.655
* λ Sagittarii		3.0	18 20 41.297	+ 3.7027	— 25 29 7.74	1.598
* χ Draconis		4.0	18 23 10.970	— 1.0790	+ 72 40 52.33	1.648
σ Octantis		6.0	18 28 7.157	+107.9120	— 89 16 25.59	2.432
1 Aquilæ		4.3	18 28 47.156	+ 3.2645	— 8 19 31.44	2.182
* ζ Pavonis		4.0	18 29 14.440	+ 7.0322	— 71 31 33 02	+ 2.410
α Lyræ (*Vega*) . . .		1.0	18 32 56.615	+ 2.0312	+ 38 40 28.11	3.146
51 Cephei (H.) .	. S. P.	5.3	18 44 45.537	+30.0810	+ 92 46 22.48	3.984
β Lyræ (*var.*) . . .		4.0	18 45 43.424	+ 2.2141	+ 33 13 34.83	3.956
σ Sagittarii		2.3	18 47 56.894	+ 3.7220	— 26 26 30.55	4.088
50 Draconis		6.0	18 50 10.306	— 1.9039	+ 75 17 38.74	+ 4.430
* γ Lyræ		3.3	18 54 31.792	+ 2.2442	+ 32 31 42.46	4.737
ζ Aquilæ		3.0	18 59 59.210	+ 2.7568	+ 13 41 20.51	5.086
* ι Lyræ		5.0	19 3 5.496	+ 2.1411	+ 35 54 57.18	5.460
* 25 Camelopardalis	. S. P.	4.7	19 6 10.840	+12.9960	+ 97 21 57.07	+ 5.741

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MEAN PLACES FOR 1882.0. (January $-0^{d}.258$, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
d Sagittarii	5.0	19	10	43.826	+ 3.5128	− 19	9	41.70	+ 6.074
* θ Lyræ	4.3	19	12	16.317	+ 2.0789	+ 37	55	26.67	6.221
δ Draconis	3.0	19	12	31.497	+ 0.0312	+ 67	27	14.33	6.326
τ Draconis	4.7	19	17	48.941	− 1.1128	+ 73	8	9.61	6.788
Piazzi vii. 67 . S. P.	6.0	19	18	35.577	+ 6.3049	+111	17	44.15	6.780
δ Aquilæ	3.3	19	19	32.926	+ 3.0254	+ 2	52	49.98	+ 6.898
* β Cygni	3.0	19	25	57.769	+ 2.4193	+ 27	42	45.37	7.339
κ Aquilæ	5.0	19	30	32.572	+ 3.2292	− 7	17	19.15	7.719
* β Sagittæ	4.3	19	35	44.952	+ 2.6955	+ 17	12	12.12	8.108
γ Aquilæ	3.0	19	40	38.992	+ 2.8523	+ 10	19	35.84	8.517
* δ Cygni	2.7	19	41	17.240	+ 1.8761	+ 44	50	35.74	+ 8.613
λ Ursæ Minoris	6.3	19	42	5.828	−62.7340	+ 88	56	54.04	8.652
α Aquilæ (*Altair*)	1.3	19	45	1.566	+ 2.9278	+ 8	33	27.35	9.242
* Groombr. 1374 . S. P.	5.7	19	46	2.659	+ 7.2992	+105	46	10.05	8.984
* ε Pavonis	4.0	19	46	55.795	+ 7.0609	− 73	13	8.60	8.913
ε Draconis	3.7	19	48	33.877	− 0.1760	+ 69	58	2.61	+ 9.176
β Aquilæ	4.0	19	49	31.025	+ 2.9472	+ 6	6	46.48	8.732
* γ Sagittæ	3.7	19	53	30.580	+ 2.6678	+ 19	10	21.02	9.569
* c Sagittarii	5.0	19	55	24.000	+ 3.6960	− 28	2	11.92	9.695
τ Aquilæ	6.0	19	58	22.564	+ 2.9332	+ 6	56	44.86	9.912
3 Ursæ Majoris (H.) S. P.	5.7	20	1	3.407	+ 6.0579	+111	10	50.34	+ 10.104
* θ Aquilæ	3.0	20	5	12.942	+ 3.0975	− 1	10	14.26	10.429
* o^1 Cygni	4.3	20	9	54.970	+ 1.8893	+ 46	23	2.08	10.772
α^2 Capricorni	3.0	20	11	30.422	+ 3.3328	− 12	54	34.33	10.886
κ Cephei (*pr.*)	4.3	20	12	50.297	− 1.9109	+ 77	21	19.57	11.012
α Pavonis	2.0	20	16	18.691	+ 4.7885	− 57	6	41.25	+ 11.145
γ Cygni	2.3	20	17	59.708	+ 2.1535	+ 39	52	46.21	11.351
π Capricorni	5.0	20	20	33.992	+ 3.4405	− 18	35	51.08	11.525
ε Delphini	4.0	20	27	34.554	+ 2.8673	+ 10	54	11.20	12.018
Groombridge 3241	6.3	20	30	30.401	− 0.2149	+ 72	7	54.57	12.223
* α Delphini	3.7	20	34	9.423	+ 2.7878	+ 15	29	47.26	+ 12.497
* β Pavonis	3.0	20	34	18.630	+ 5.4825	− 66	37	30.82	12.481
α Cygni	1.7	20	37	24.584	+ 2.0441	+ 44	51	32.86	12.707
* ψ Capricorni	4.3	20	39	6.365	+ 3.5598	− 25	41	38.15	12.660
* ε Cygni	2.7	20	41	26.218	+ 2.4273	+ 33	31	43.41	13.319
μ Aquarii	4.7	20	46	17.334	+ 3.2404	− 9	25	30.88	+ 13.263
ν Cygni	4.0	20	52	46.463	+ 2.2339	+ 40	42	48.10	13.708
12 Year Cat. 1879	6.0	20	52	53.957	− 2.5258	+ 80	6	32.30	13.704
σ^2 Ursæ Majoris . S. P.	5.0	20	59	59.637	+ 5.3648	+112	23	16.18	14.235
61^1 Cygni	5.0	21	1	36.499	+ 2.6829	+ 38	10	10.96	17.510
ζ Cygni	3.0	21	7	54.850	+ 2.5494	+ 29	44	36.31	+ 14.594
* τ Cygni	4.0	21	10	4.883	+ 2.3931	+ 37	32	31.71	15.246
α Cephei	2.7	21	15	45.762	+ 1.4371	+ 62	5	9.11	15.163
1 Pegasi	4.3	21	16	37.755	+ 2.7721	+ 19	18	0.85	15.223
* ζ Capricorni	4.0	21	19	55.669	+ 3.4339	− 22	55	17.70	15.377
1 Draconis (H.). . S. P.	4.3	21	20	9.558	+ 9.0576	+ 98	9	14.69	+ 15.389
d Ursæ Majoris . S. P.	4.7	21	24	1.471	+ 5.4136	+109	39	8.31	15.527
β Aquarii	3.0	21	25	20.804	+ 3.1623	− 6	5	22.65	15.643
β Cephei (*pr.*)	3.0	21	27	7.943	+ 0.7966	+ 70	2	34.05	15.751
ξ Aquarii	5.0	21	31	28.206	+ 3.1986	− 8	22	57.79	+ 15.952

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MEAN PLACES FOR 1882.0. (January —0^d.258, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
* 74 Cygni	5.0	21	32	13.201	+ 2.4009	+ 39	53	1.28	+ 16.037
* λ^1 Octantis.	5.3	21	32	39.660	9.8700	— 83	15	34.23	15.974
ε Pegasi	2.3	21	38	23.451	2.9467	+ 9	20	4.47	16.340
11 Cephei	5.0	21	40	11.414	0.9036	+ 70	46	5.77	16.533
* π^2 Cygni	4.3	21	42	26.077	2.2126	+ 48	45	50.44	16.530
μ Capricorni	5.0	21	46	51.717	+ 3.2769	— 14	6	23.75	+ 16.762
* 16 Pegasi	5.3	21	47	41.600	2.7274	+ 25	22	13.42	16.804
79 Draconis	6.3	21	51	23.790	0.7326	+ 73	8	38.97	17.010
α Aquarii	3.0	21	59	43.384	3.0830	— 0	53	33.35	17.341
α Gruis	2.0	22	0	47.430	3.8094	— 47	31	53.63	17.229
* π Pegasi	4.0	22	4	44.830	+ 2.6605	+ 32	35	58.65	+ 17.566
* υ Octantis	6.0	22	8	38.572	13.4340	— 86	33	54.90	17.820
32 Ursæ Majoris . . S. P.	6.0	22	9	27.049	4.4293	+ 114	18	13.87	17.791
θ Aquarii	4.3	22	10	36.395	3.1696	— 8	22	13.34	17.787
* γ Aquarii	3.3	22	15	33.653	3.1011	— 1	58	53.61	18.026
π Aquarii	4.7	22	19	15.059	+ 3.0650	+ 0	46	44.58	+ 18.143
* σ Aquarii	5.0	22	24	24.044	3.1764	— 11	16	52.80	18.306
9 Draconis (H.) . . S. P.	4.7	22	25	2.086	5.2834	+ 103	40	47.81	18.372
* 7 Lacertæ.	4.0	22	26	25.881	2.4609	+ 49	40	33.89	18.406
η Aquarii	4.0	22	29	17.562	3.0838	— 0	43	31.13	18.446
226 Cephei (B.) . . .	5.3	22	30	11.908	+ 1.0799	+ 75	37	6.15	+ 18.525
* β Octantis.	4.7	22	33	54.423	6.5320	— 81	59	56.71	18.660
* 10 Lacertæ	5.0	22	33	58.047	2.6855	+ 38	26	10.93	18.660
ζ Pegasi	3.3	22	35	34.640	2.9907	+ 10	12	56.60	18.695
* λ Pegasi	4.0	22	40	50.879	2.8846	+ 22	56	41.86	18.865
ι Cephei	3.3	22	45	28.833	+ 2.1201	+ 65	34	47.66	+ 18.870
λ Aquarii	4.0	22	46	27.507	3.1333	— 8	12	25.67	19.066
* Groombr. 1706 . S. P.	6.0	22	50	28.498	4.9934	+ 101	35	53.14	19.166
α Pis. Aus. (*Fomalhaut*)	1.3	22	51	7.677	3.3264	— 30	14	50.24	18.984
α Ursæ Majoris . . S. P.	2.0	22	56	26.138	3.7535	+ 117	36	44.13	19.354
* ο Andromedæ . . .	3.7	22	56	29.602	+ 2.7485	+ 41	41	30.73	+ 19.280
α Pegasi (*Markab*) . .	2.0	22	58	53.017	2.9845	+ 14	34	14.04	19.294
* φ Aquarii	4.3	23	8	12.687	3.1091	— 6	41	5.49	19.352
υ Cephei	5.3	23	13	47.126	2.4409	+ 67	27	57.89	19.665
* τ Pegasi	4.7	23	14	47.838	2.9627	+ 23	5	40.14	19.651
θ Piscium	4.7	23	21	58.954	+ 3.0410	+ 5	43	51.06	+ 19.721
λ Draconis . . . S. P.	3.3	23	24	22.996	3.6296	+ 110	1	4.17	19.832
* λ Andromedæ . . .	4.0	23	31	47.496	2.9201	+ 45	49	7.23	19.469
ι Piscium	4.3	23	33	52.883	3.0839	+ 4	59	12.54	19.481
γ Cephei	3.3	23	34	30.662	2.4099	+ 76	58	25.38	20.074
* i^1 Aquarii	5.0	23	38	4.862	+ 3.1177	— 18	55	54.12	+ 19.957
* δ Sculptoris	4.3	23	42	46.714	3.1337	— 28	46	56.76	19.854
* γ^1 Octantis.	5.3	23	45	7.748	3.7140	— 82	40	28.60	19.992
Groombridge 4163 .	7.0	23	49	6.314	2.8584	+ 73	45	13.18	20.022
ω Piscium	4.0	23	53	15.145	3.0780	+ 6	12	35.98	19.930
* 33 Piscium	5.0	23	59	17.744	+ 3.0710	— 6	22	3.48	+ 20.144

*Apparent places of stars marked with an asterisk are not given in this Ephemeris.

α URSÆ MINORIS (*Polaris*).

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 1 15	+88° 41′		h m 1 15	+88° 41′		h m 1 14	+88° 40′		h m 1 14	+88° 40′
	s	″		s	″		s	″		s	″
0.3	57.87	11.9	1.2	29.03	12.1	1.1	68.22	67.1	1.0	57.70	58.0
1.3	57.09	12.0	2.2	28.08	12.0	2.1	67.55	66.9	2.0	57.60	57.7
2.3	56.29	12.2	3.2	27.11	11.9	3.1	66.87	66.6	3.0	57.57	57.3
3.3	55.44	12.3	4.2	26.13	11.8	4.1	66.20	66.3	4.0	57.61	56.9
4.3	54.54	12.4	5.2	25.17	11.7	5.1	65.58	66.0	5.0	57.72	56.6
5.3	53.57	12.5	6.2	24.27	11.5	6.1	65.03	65.7	6.0	57.86	56.3
6.3	52.55	12.6	7.2	23.43	11.3	7.1	64.56	65 4	7.0	58.01	56.0
7.2	51.51	12.7	8.2	22.65	11.1	8.1	64.16	65.1	8.0	58.16	55.7
8.2	50.48	12.7	9.2	21.92	11.0	9.1	63.81	64.8	9.0	58.29	55.4
9.2	49.47	12.7	10.2	21.23	10.8	10.1	63.48	64.5	10.0	58.38	55.1
10.2	48.51	12.7	11.2	20.55	10.6	11.1	63.16	64.3	11.0	58.43	54.9
11.2	47.60	12.7	12.1	19.86	10.5	12.1	62.83	64.0	12.0	58.46	54.6
12.2	46.75	12.7	13.1	19.14	10.4	13.1	62.46	63.8	13.0	58.49	54.3
13.2	45.93	12.7	14.1	18.38	10.2	14.1	62.04	63.5	14.0	58.55	54.0
14.2	45.13	12.8	15.1	17.58	10.1	15.1	61.59	63.3	15.0	58.66	53.6
15.2	44.31	12.8	16.1	16.75	9.9	16.1	61.14	63.0	16.0	58.83	53.3
16.2	43.47	12.8	17.1	15.90	9.8	17.1	60.70	62.7	17.0	59.08	52.9
17.2	42.58	12.9	18.1	15.06	9.6	18.1	60.29	62.4	18.0	59.39	52.6
18.2	41.64	12.9	19.1	14.26	9.3	19.1	59.93	62.0	19.0	59.74	52.3
19.2	40.65	12.9	20.1	13.53	9.1	20.1	59.64	61.7	20.0	60.13	52.0
20.2	39.63	12.9	21.1	12.86	8.9	21.0	59.43	61.4	21.0	60.53	51.7
21.2	38.60	12.9	22.1	12.24	8.6	22.0	59.28	61.0	22.0	60.91	51.4
22.2	37.59	12.8	23.1	11.68	8.4	23.0	59.17	60.7	23.0	61.25	51.2
23.2	36.60	12.8	24.1	11.15	8.2	24.0	59.08	60.4	24.0	61.54	50.9
24.2	35.67	12.7	25.1	10.62	7.9	25.0	58.99	60.1	25.0	61.80	50.6
25.2	34.81	12.6	26.1	10.07	7.7	26.0	58.87	59.8	25.9	62.05	50.4
26.2	34.00	12.5	27.1	9.50	7.5	27.0	58.71	59.6	26.9	62.31	50.1
27.2	33.21	12.5	28.1	8.88	7.3	28.0	58.52	59.3	27.9	62.60	49.8
28.2	32.43	12.4	29.1	8.22	7.1	29.0	58.30	59.0	28.9	62.94	49.4
29.2	31.64	12.3	30.1	7.55	6.9	30.0	58.07	58.7	29.9	63.34	49.1
30.2	30.82	12.2	31.1	6.87	6.6	31.0	57.86	58.3	30.9	63.82	48.8
31.2	29.95	12.2	32.1	6.20	6.3	32.0	57.70	58.0	31.9	64.36	48.5

α URSÆ MINORIS (*Polaris*).

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 1 15	° ′ +88 40		h m 1 15	° ′ +88 40		h m 1 15	° ′ +88 40		h m 1 16	° ′ +88 40
	s	″		s	″		s	″		s	″
1.9	4.36	48.5	1.9	25.48	42.0	1.8	53.06	40.4	1.7	22.03	43.7
2.9	4.95	48.2	2.9	26.36	41.9	2.8	53.94	40.4	2.7	22.86	43.9
3.9	5.56	47.9	3.8	27.19	41.8	3.8	54.80	40.5	3.7	23.74	44.0
4.9	6.17	47.7	4.8	27.97	41.8	4.8	55.66	40.5	4.7	24.66	44.2
5.9	6.76	47.5	5.8	28.72	41.7	5.8	56.55	40.6	5.7	25.62	44.4
6.9	7.31	47.3	6.8	29.47	41.6	6.8	57.48	40.6	6.7	26.60	44.6
7.9	7.82	47.1	7.8	30.25	41.4	7.8	58.47	40.6	7.7	27.57	44.8
8.9	8.29	46.8	8.8	31.08	41.3	8.8	59.50	40.6	8.7	28.52	45.0
9.9	8.75	46.6	9.8	31.95	41.2	9.7	60.57	40.7	9.7	29.42	45.3
10.9	9.23	46.4	10.8	32.87	41.1	10.7	61.66	40.7	10.7	30.26	45.5
11.9	9.75	46.1	11.8	33.84	40.9	11.7	62.74	40.8	11.7	31.04	45.8
12.9	10.32	45.9	12.8	34.86	40.8	12.7	63.79	40.9	12.7	31.76	46.0
13.9	10.95	45.6	13.8	35.90	40.8	13.7	64.79	41.0	13.6	32.44	46.3
14.9	11.65	45.3	14.8	36.92	40.7	14.7	65.72	41.2	14.6	33.12	46.5
15.9	12.40	45.1	15.8	37.90	40.7	15.7	66.60	41.3	15.6	33.82	46.7
16.9	13.18	44.9	16.8	38.84	40.7	16.7	67.45	41.4	16.6	34.56	46.9
17.9	13.97	44.7	17.8	39.73	40.6	17.7	68.28	41.5	17.6	35.34	47.1
18.9	14.75	44.5	18.8	40.58	40.6	18.7	69.12	41.6	18.6	36.17	47.4
19.9	15.50	44.3	19.8	41.39	40.6	19.7	69.98	41.7	19.6	37.03	47.6
20.9	16.21	44.2	20.8	42.20	40.5	20.7	70.88	41.8	20.6	37.91	47.8
21.9	16.87	44.0	21.8	43.05	40.5	21.7	71.84	41.9	21.6	38.77	48.1
22.9	17.49	43.8	22.8	43.94	40.4	22.7	72.85	42.0	22.6	39.60	48.4
23.9	18.10	43.6	23.8	44.88	40.3	23.7	73.90	42.1	23.6	40.38	48.7
24.9	18.73	43.4	24.8	45.88	40.3	24.7	74.96	42.2	24.6	41.09	49.1
25.9	19.40	43.2	25.8	46.92	40.2	25.7	75.99	42.4	25.6	41.74	49.4
26.9	20.13	43.0	26.8	47.99	40.2	26.7	76.98	42.6	26.6	42.34	49.7
27.9	20.93	42.8	27.8	49.09	40.2	27.7	77.93	42.8	27.6	42.92	50.0
28.9	21.79	42.6	28.8	50.16	40.2	28.7	78.82	43.0	28.6	43.50	50.3
29.9	22.70	42.4	29.8	51.18	40.3	29.7	79.66	43.2	29.6	44.10	50.6
30.9	23.63	42.3	30.8	52.14	40.3	30.7	80.46	43.4	30.6	44.73	50.8
31.9	24.56	42.1	31.8	53.06	40.4	31.7	81.24	43.5	31.6	45.41	51.1
32.9	25.48	42.0	32.8	53.94	40.4	32.7	82.03	43.7	32.6	46.13	51.4

α URSÆ MINORIS (*Polaris*).

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 1 16	° ' +88 40		h m 1 17	° ' +88 41		h m 1 16	° ' +88 41		h m 1 16	° ' +88 41
	s	"		s	"		s	"		s	"
1.6	46.13	51.4	1.5	0.24	1.7	1.4	61.74	13.4	1.4	49.34	23.1
2.6	46.87	51.7	2.5	0.59	2.1	2.4	61.45	13.8	2.4	48.61	23.4
3.6	47.61	52.0	3.5	0.88	2.5	3.4	61.12	14.1	3.3	47.89	23.6
4.6	48.33	52.3	4.5	1.11	2.9	4.4	60.77	14.5	4.3	47.21	23.9
5.6	49.01	52.6	5.5	1.27	3.3	5.4	60.43	14.8	5.3	46.58	24.1
6.6	49.62	53.0	6.5	1.36	3.7	6.4	60.11	15.1	6.3	46.00	24.3
7.6	50.16	53.4	7.5	1.42	4.1	7.4	59.83	15.4	7.3	45.44	24.5
8.6	50.64	53.7	8.5	1.48	4.4	8.4	59.59	15.8	8.3	44.87	24.7
9.6	51.08	54.1	9.5	1.55	4.8	9.4	59.38	16.1	9.3	44.28	25.0
10.6	51.49	54.4	10.5	1.66	5.1	10.4	59.18	16.4	10.3	43.64	25.3
11.6	51.90	54.7	11.5	1.81	5.4	11.4	58.97	16.8	11.3	42.94	25.5
12.6	52.35	55.0	12.5	1.99	5.8	12.4	58.73	17.1	12.3	42.17	25.8
13.6	52.83	55.3	13.5	2.19	6.2	13.4	58.43	17.5	13.3	41.35	26.0
14.6	53.36	55.6	14.5	2.40	6.5	14.4	58.05	17.9	14.3	40.49	26.3
15.6	53.93	55.9	15.5	2.59	6.9	15.4	57.61	18.2	15.3	39.61	26.5
16.6	54.51	56.2	16.5	2.74	7.3	16.4	57.12	18.6	16.3	38.73	26.7
17.6	55.08	56.6	17.5	2.83	7.8	17.4	56.60	18.9	17.3	37.88	26.8
18.6	55.62	56.9	18.5	2.85	8.2	18.4	56.07	19.3	18.3	37.08	27.0
19.5	56.12	57.3	19.5	2.79	8.6	19.4	55.55	19.6	19.3	36.33	27.1
20.5	56.55	57.7	20.5	2.68	9.0	20.4	55.06	19.9	20.3	35.62	27.3
21.5	56.92	58.1	21.5	2.55	9.4	21.4	54.61	20.1	21.3	34.92	27.4
22.5	57.24	58.5	22.5	2.43	9.7	22.4	54.19	20.4	22.3	34.21	27.6
23.5	57.52	58.9	23.5	2.32	10.1	23.4	53.79	20.7	23.3	33.47	27.8
24.5	57.78	59.2	24.5	2.24	10.4	24.4	53.40	21.0	24.3	32.68	28.0
25.5	58.05	59.6	25.5	2.21	10.7	25.4	52.99	21.3	25.3	31.83	28.2
26.5	58.34	59.9	26.5	2.21	11.1	26.4	52.53	21.6	26.3	30.92	28.4
27.5	58 67	60.3	27.4	2.22	11.4	27.4	52.01	22.0	27.3	29.96	28.5
28.5	59.04	60.6	28.4	2.22	11.8	28.4	51.42	22.3	28.3	28.97	28.6
29.5	59.44	60.9	29.4	2.19	12.2	29.4	50.77	22.6	29.3	27.97	28.7
30.5	59.85	61.3	30.4	2.11	12.6	30.4	50.07	22.9	30.3	26.99	28.8
31.5	60.24	61.7	31.4	1.96	13.0	31.4	49.34	23.1	31.3	26.05	28.9
32.5	60.59	62.1	32.4	1.74	13.4	32.4	48.61	23.4	32.3	25.16	29.0

51 CEPHEI (*Hev.*)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 6 45	° ′ +87 13		h m 6 45	° ′ +87 13		h m 6 45	° ′ +87 13		h m 6 44	° ′ +87 13
	s	″		s	″		s	″		s	″
0.5	22.40	31.7	1.4	21.25	41.5	1.3	13.26	47.9	1.2	60.30	50.2
1.5	22.53	32.0	2.4	21.08	41.8	2.3	12.89	48.1	2.2	59.80	50.2
2.5	22.68	32.3	3.4	20.88	42.1	3.3	12.49	48.3	3.2	59.31	50.2
3.5	22.81	32.6	4.4	20.65	42.4	4.3	12.07	48.4	4.2	58.84	50.1
4.5	22.92	32.9	5.4	20.39	42.7	5.3	11.63	48.6	5.2	58.39	50.0
5.5	23.01	33.3	6.4	20.11	43.0	6.3	11.18	48.7	6.2	57.96	49.9
6.5	23.07	33.6	7.4	19.82	43.2	7.3	10.73	48.8	7.2	57.56	49.9
7.5	23.10	34.0	8.4	19.53	43.5	8.3	10.29	48.9	8.2	57.19	49.8
8.5	23.09	34.3	9.4	19.25	43.7	9.3	9.87	49.0	9.2	56 83	49.7
9.5	23.06	34.7	10.4	18.99	43.9	10.3	9.48	49.1	10.2	56.46	49.7
10.5	23.02	35.0	11.4	18.76	44.1	11.3	9.11	49.2	11.2	56.08	49.6
11.5	22.97	35.3	12.4	18.54	44.3	12.3	8.75	49.3	12.2	55.69	49.5
12.5	22.93	35.6	13.4	18.33	44.6	13.3	8.40	49.4	13.2	55.28	49.5
13.5	22.90	35.8	14.4	18.11	44.8	14.3	8.04	49.5	14.2	54.85	49.4
14.4	22.89	36.1	15.4	17.87	45.1	15.3	7.67	49.6	15.2	54.40	49.4
15.4	22.89	36.4	16.4	17.61	45.3	16.3	7.27	49.7	16.2	53.95	49.3
16.4	22.90	36 7	17.4	17.32	45.6	17.3	6.84	49.8	17.2	53.51	49.1
17.4	22.92	37.0	18.4	17.00	45.9	18.3	6.38	49.9	18.2	53.09	49.0
18.4	22.92	37.3	19.4	16.65	46.1	19.3	5.90	50.0	19.2	52.69	48.8
19.4	22.90	37.6	20.4	16.28	46.3	20.3	5.42	50.0	20.2	52.31	48.6
20.4	22.85	38.0	21.4	15.91	46.5	21.3	4.95	50.1	21.2	51.95	48.5
21.4	22.76	38.3	22.4	15.55	46.7	22.3	4.50	50.1	22.2	51.61	48.3
22.4	22.63	38.7	23.3	15.20	46.8	23.3	4.07	50.0	23.2	51.28	48.2
23.4	22.48	39.0	24.3	14.86	47.0	24.3	3.66	50.0	24.2	50.95	48.1
24.4	22.32	39.3	25.3	14.54	47.1	25.3	3.27	50.0	25.2	50.61	47.9
25.4	22.16	39.6	26.3	14.23	47.3	26.3	2.89	50.0	26.2	50.25	47.8
26.4	22.01	39.8	27.3	13.92	47.5	27.3	2.50	50.1	27.2	49.86	47.7
27.4	21.87	40.1	28.3	13.60	47.7	28.3	2.10	50.1	28.2	49.45	47.5
28.4	21.74	40.3	29.3	13.26	47.9	29.3	1.68	50.2	29.2	49.03	47.4
29.4	21.62	40.6	30.3	12.89	48.1	30.3	1.24	50.2	30.2	48.62	47.2
30.4	21.51	40.9	31.3	12.49	48.3	31.2	0.78	50.2	31.2	48.23	47.0
31.4	21.39	41.2	32.3	12.07	48.4	32.2	0.30	50.2	32.2	47.86	46.8

51 CEPHEI (*Hev.*)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 6 44	° ′ +87 13		h m 6 44	° ′ +87 13		h m 6 44	° ′ +87 13		h m 6 44	° ′ +87 13
	s	″		s	″		s	″		s	″
1.2	48.23	47.0	1.1	40.64	39.2	1.0	40.14	29.8	1.9	46.88	20.4
2.2	47.86	46.8	2.1	40.56	38.9	2.0	40.28	29.5	2.9	47.15	20.1
3.2	47.52	46.6	3.1	40.50	38.6	3.0	40.41	29.3	3.9	47.43	19.8
4.2	47.22	46.3	4.1	40.43	38.3	4.0	40.53	29.0	4.9	47.72	19.5
5.2	46.94	46.1	5.1	40.36	38.1	5.0	40.64	28.7	5.9	48.04	19.2
6.1	46.68	45.8	6.1	40.28	37.8	6.0	40.74	28.4	6.9	48.38	18.9
7.1	46.43	45.7	7.1	40.18	37.5	7.0	40.83	28.1	7.9	48.75	18.6
8.1	46.17	45.5	8.1	40.07	37.3	8.0	40.92	27.8	8.9	49.15	18.4
9.1	45.91	45.3	9.1	39.95	37.0	9.0	41.03	27.4	9.9	49.55	18.1
10.1	45.63	45.1	10.1	39.84	36.7	10.0	41.17	27.1	10.9	49.96	17.8
11.1	45.33	44.9	11.1	39.74	36.3	11.0	41.35	26.7	11.9	50.37	17.6
12.1	45.01	44.7	12.0	39.65	36.0	12.0	41.56	26.4	12.9	50.77	17.4
13.1	44.68	44.5	13.0	39.59	35.6	13.0	41.79	26.1	13.9	51.14	17.2
14.1	44.36	44.2	14.0	39.57	35.3	14.0	42.03	25.7	14.9	51.49	17.0
15.1	44.07	44.0	15.0	39.57	34.9	15.0	42.27	25.4	15.9	51.82	16.8
16.1	43.81	43.7	16.0	39.59	34.6	16.0	42.50	25.2	16.9	52.15	16.6
17.1	43.57	43.4	17.0	39.62	34.3	17.0	42.72	24.9	17.9	52.49	16.4
18.1	43.35	43.1	18.0	39.65	34.0	17.9	42.91	24.6	18.9	52.85	16.1
19.1	43.15	42.8	19.0	39.67	33.7	18.9	43.09	24.4	19.9	53.23	15.9
20.1	42.97	42.5	20.0	39.67	33.4	19.9	43.26	24.1	20.8	53.64	15.6
21.1	42.80	42.3	21.0	39.66	33.2	20.9	43.43	23.8	21.8	54.09	15.4
22.1	42.62	42.1	22.0	39.63	32.9	21.9	43.61	23.5	22.8	54.57	15.1
23.1	42.43	41.8	23.0	39.59	32.6	22.9	43.82	23.2	23.8	55.07	14.9
24.1	42.22	41.6	24.0	39.56	32.2	23.9	44.06	22.8	24.8	55.56	14.7
25.1	41.99	41.4	25.0	39.55	31.9	24.9	44.33	22.5	25.8	56.04	14.6
26.1	41.75	41.1	26.0	39.58	31.6	25.9	44.64	22.2	26.8	56.50	14.4
27.1	41.50	40.8	27.0	39.64	31.2	26.9	44.97	21.9	27.8	56.94	14.3
28.1	41.27	40.5	28.0	39.73	30.8	27.9	45.32	21.6	28.8	57.37	14.1
29.1	41.07	40.2	29.0	39.85	30.5	28.9	45.66	21.3	29.8	57.79	13.9
30.1	40.89	39.9	30.0	39.99	30.2	29.9	45.99	21.1	30.8	58.19	13.8
31.1	40.75	39.6	31.0	40.14	29.8	30.9	46.30	20.8	31.8	58.61	13.6
32.1	40.64	39.2	32.0	40.28	29.5	31.9	46.60	20.6	32.8	59.04	13.4

51 CEPHEI (*Hev.*)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 6 44	° ′ +87 13		h m 6 45	° ′ +87 13		h m 6 45	° ′ +87 13		h m 6 45	° ′ +87 13
	s	″		s	″		s	″		s	″
1.8	59.04	13.4	1.7	14.20	10.1	1.7	30.43	11.2	1.6	43.23	16.7
2.8	59.50	13.2	2.7	14.77	10.0	2.7	30.94	11.4	2.6	43.53	17.0
3.8	59.99	12.9	3.7	15.35	10.0	3.7	31.42	11.5	3.6	43.80	17.3
4.8	60.50	12.8	4.7	15.92	10.0	4.6	31.88	11.7	4.6	44.06	17.5
5.8	61.02	12.6	5.7	16.48	10.0	5.6	32.31	11.9	5.6	44.32	17.8
6.8	61.55	12.4	6.7	17.02	10.0	6.6	32.72	12.0	6.6	44.59	18.0
7.8	62.09	12.3	7.7	17.54	10.1	7.6	33.13	12.1	7.6	44.88	18.2
8.8	62.61	12.2	8.7	18.03	10.1	8.6	33.55	12.3	8.6	45.19	18.4
9.8	63.10	12.1	9.7	18.50	10.1	9.6	33.99	12.4	9.5	45.52	18.7
10.8	63.57	12.0	10.7	18.96	10.1	10.6	34.45	12.5	10.5	45.86	18.9
11.8	64.01	11.9	11.7	19.43	10.1	11.6	34.92	12.6	11.5	46.20	19.2
12.8	64.44	11.8	12.7	19.92	10.1	12.6	35.41	12.7	12.5	46.53	19.5
13.8	64.88	11.7	13.7	20.43	10.1	13.6	35.92	12.9	13.5	46.83	19.8
14.8	65.33	11.5	14.7	20.96	10.1	14.6	36.42	13.1	14.5	47.09	20.1
15.8	65.80	11.4	15.7	21.52	10.1	15.6	36.91	13.3	15.5	47.32	20.4
16.8	66.30	11.2	16.7	22.09	10.1	16.6	37.38	13.5	16.5	47.53	20.8
17.8	66.83	11.1	17.7	22.68	10.1	17.6	37.81	13.7	17.5	47.72	21.1
18.8	67.38	11.0	18.7	23.26	10.2	18.6	38.21	13.9	18.5	47.89	21.3
19.8	67.94	10.9	19.7	23.82	10.2	19.6	38.59	14.1	19.5	48.06	21.6
20.8	68.51	10.8	20.7	24.35	10.3	20.6	38.96	14.3	20.5	48.24	21.9
21.8	69.08	10.7	21.7	24.87	10.4	21.6	39.32	14.5	21.5	48.43	22.1
22.8	69.64	10.7	22.7	25.36	10.5	22.6	39.69	14.7	22.5	48.64	22.4
23.8	70.17	10.6	23.7	25.83	10.6	23.6	40.07	14.9	23.5	48.87	22.7
24.8	70.67	10.6	24.7	26.29	10.6	24.6	40.47	15.1	24.5	49.09	23.0
25.7	71.16	10.6	25.7	26.76	10.7	25.6	40.89	15.2	25.5	49.29	23.3
26.7	71.64	10.5	26.7	27.24	10.7	26.6	41.32	15.4	26.5	49.48	23.6
27.7	72.12	10.4	27.7	27.74	10.8	27.6	41.74	15.7	27.5	49.64	24.0
28.7	72.61	10.4	28.7	28.26	10.8	28.6	42.15	15.9	28.5	49.77	24.3
29.7	73.11	10.3	29.7	28.80	10.9	29.6	42.54	16.2	29.5	49.87	24.7
30.7	73.64	10.2	30.7	29.35	11.0	30.6	42.90	16.5	30.5	49.94	25.0
31.7	74.20	10.1	31.7	29.90	11.1	31.6	43.23	16.7	31.5	49.97	25.3
32.7	74.77	10.0	32.7	30.43	11.2	32.6	43.53	17.0	32.5	50.00	25.6

δ URSÆ MINORIS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
	18 9	+86 36		18 9	+86 36		18 10	+86 36		18 10	+86 36
	s	″		s	″		s	″		s	″
1.0	54.33	36.5	1.9	57.68	26.6	1.8	5.65	21.0	1.7	16.84	20.2
2.0	54.30	36.2	2.9	57.90	26.3	2.8	6.00	20.9	2.7	17.23	20.3
3.0	54.27	35.9	3.9	58.14	26.0	3.8	6.37	20.7	3.7	17.62	20.4
4.0	54.25	35.6	4.9	58.40	25.7	4.8	6.75	20.6	4.7	17.99	20.5
5.0	54.25	35.2	5.9	58.67	25.5	5.8	7.13	20.5	5.7	18.34	20.6
6.0	54.27	34.8	6.9	58.96	25.2	6.8	7.52	20.4	6.7	18.66	20.8
7.0	54.32	34.5	7.9	59.24	25.0	7.8	7.90	20.4	7.7	18.97	20.9
8.0	54.39	34.1	8.9	59.51	24.8	8.8	8.26	20.3	8.7	19.28	21.0
9.0	54.47	33.8	9.9	59.77	24.6	9.8	8.62	20.3	9.7	19.58	21.2
9.9	54.56	33.4	10.9	60.02	24.4	10.8	8.96	20.3	10.7	19.89	21.2
10.9	54.66	33.1	11.9	60.26	24.2	11.8	9.28	20.2	11.7	20.21	21.3
11.9	54.76	32.8	12.9	60.49	24.0	12.8	9.60	20.2	12.7	20.54	21.4
12.9	54.86	32.5	13.9	60.73	23.8	13.8	9.93	20.1	13.7	20.87	21.5
13.9	54.95	32.2	14.9	60.98	23.6	14.8	10.27	20.0	14.7	21.21	21.7
14.9	55.03	32.0	15.9	61.24	23.3	15.8	10.62	19.9	15.7	21.56	21.8
15.9	55.10	31.7	16.9	61.53	23.1	16.8	10.98	19.9	16.7	21.91	22.0
16.9	55.16	31.4	17.9	61.84	22.9	17.8	11.35	19.8	17.7	22.25	22.2
17.9	55.23	31.0	18.8	62.16	22.7	18.8	11.73	19.8	18.7	22.57	22.4
18.9	55.32	30.7	19.8	62.49	22.5	19.8	12.12	19.8	19.7	22.87	22.6
19.9	55.43	30.3	20.8	62.83	22.3	20.8	12.51	19.8	20.7	23.15	22.8
20.9	55.57	30.0	21.8	63.17	22.2	21.8	12.89	19.8	21.7	23.42	23.0
21.9	55.73	29.7	22.8	63.50	22.0	22.8	13.26	19.9	22.7	23.69	23.2
22.9	55.91	29.3	23.8	63.81	21.9	23.8	13.62	19.9	23.7	23.95	23.4
23.9	56.09	29.0	24.8	64.11	21.8	24.8	13.97	20.0	24.7	24.22	23.6
24.9	56.28	28.8	25.8	64.41	21.7	25.7	14.30	20.0	25.7	24.50	23.7
25.9	56.46	28.5	26.8	64.70	21.5	26.7	14.62	20.0	26.7	24.79	23.9
26.9	56.64	28.3	27.8	65.00	21.4	27.7	14.95	20.1	27.7	25.09	24.1
27.9	56.82	28.0	28.8	65.32	21.2	28.7	15.30	20.1	28.7	25.40	24.3
28.9	56.99	27.8	29.8	65.65	21.0	29.7	15.67	20.1	29.7	25.71	24.5
29.9	57.15	27.5	30.8	66.00	20.9	30.7	16.05	20.1	30.6	26.01	24.7
30.9	57.31	27.2	31.8	66.37	20.7	31.7	16.44	20.1	31.6	26.29	25.0
31.9	57.48	26.9	32.8	66.75	20.6	32.7	16.84	20.2	32.6	26.55	25.3

δ URSÆ MINORIS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 18 10	° ′ +86 36		h m 18 10	° ′ +86 36		h m 18 10	° ′ +86 36		h m 18 10	° ′ +86 36
	s	″		s	″		s	″		s	″
1.6	26.29	25.0	1.6	31.46	33.9	1.5	30.76	43.7	1.4	24.43	52.5
2.6	26.55	25.3	2.6	31.50	34.2	2.5	30.62	44.0	2.4	24.17	52.8
3.6	26.79	25.6	3.6	31.53	34.5	3.5	30.49	44.2	3.4	23.91	53.0
4.6	27.01	25.8	4.6	31.56	34.8	4.5	30.37	44.5	4.4	23.64	53.3
5.6	27.21	26.1	5.6	31.60	35.1	5.5	30.26	44.8	5.4	23.35	53.5
6.6	27.40	26.3	6.6	31.65	35.4	6.5	30.14	45.1	6.4	23.04	53.8
7.6	27.59	26.6	7.6	31.70	35.7	7.5	30.02	45.4	7.4	22.71	54.1
8.6	27.79	26.8	8.5	31.76	36.0	8.5	29.89	45.8	8.4	22.37	54.3
9.6	28.00	27.0	9.5	31.82	36.3	9.5	29.74	46.1	9.4	22.02	54.6
10.6	28.22	27.2	10.5	31.87	36.7	10.5	29.57	46.5	10.4	21.67	54.8
11.6	28.46	27.5	11.5	31.90	37.0	11.5	29.38	46.8	11.4	21.31	55.0
12.6	28.70	27.7	12.5	31.91	37.4	12.5	29.17	47.1	12.4	20.96	55.1
13.6	28.93	28.0	13.5	31.90	37.8	13.4	28.96	47.5	13.4	20.63	55.3
14.6	29.14	28.3	14.5	31.88	38.1	14.4	28.74	47.7	14.4	20.32	55.5
15.6	29.33	28.6	15.5	31.84	38.5	15.4	28.52	48.0	15.4	20.02	55.7
16.6	29.49	29.0	16.5	31.79	38.8	16.4	28.31	48.3	16.4	19.71	55.8
17.6	29.64	29.3	17.5	31.73	39.1	17.4	28.12	48.5	17.3	19.39	56.0
18.6	29.78	29.6	18.5	31.68	39.4	18.4	27.94	48.8	18 3	19.07	56.3
19.6	29.90	29.9	19.5	31.65	39.7	19.4	27.76	49.0	19.3	18.73	56.5
20.6	30.01	30.2	20.5	31.63	40.0	20.4	27.58	49.3	20.3	18.37	56.7
21.6	30.13	30.5	21.5	31.61	40.3	21.4	27.39	49.6	21.3	18.00	56.9
22.6	30.26	30.7	22.5	31.59	40.6	22.4	27.18	49.9	22.3	17.61	57.1
23.6	30.41	31.0	23.5	31.56	41.0	23.4	26.95	50.3	23.3	17.20	57.3
24.6	30.56	31.3	24.5	31.53	41.3	24.4	26.70	50.6	24.3	16.78	57.4
25.6	30.72	31.5	25.5	31.48	41.7	25.4	26.43	50.9	25.3	16.37	57.5
26.6	30.88	31.8	26.5	31.41	42.0	26.4	26.14	51.2	26.3	15.97	57.6
27.6	31.03	32.2	27.5	31.31	42.4	27.4	25.84	51.4	27.3	15.59	57.8
28.6	31.16	32.5	28.5	31.19	42.7	28.4	25.54	51.7	28.3	15.22	57.9
29.6	31.27	32.9	29.5	31.05	43.1	29.4	25.25	51.9	29.3	14.85	58.0
30.6	31.35	33.2	30.5	30.91	43.4	30.4	24.97	52.1	30.3	14.49	58.1
31.6	31.41	33.6	31.5	30.76	43.7	31.4	24.70	52.3	31.3	14.13	58.3
32.6	31.46	33.9	32.5	30.62	44.0	32.4	24.43	52.5	32.3	13.76	58.4

δ URSÆ MINORIS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	$18^{h}\ 10^{m}$	$+86^{\circ}\ 36'$		$18^{h}\ 9^{m}$	$+86^{\circ}\ 36'$		$18^{h}\ 9^{m}$	$+86^{\circ}\ 36'$		$18^{h}\ 9^{m}$	$+86^{\circ}\ 36'$
	s	″		s	″		s	″		s	″
1.3	13.76	58.4	1.2	61.23	60.2	1.1	48.61	57.1	1.1	39.62	50.0
2.3	13.37	58.6	2.2	60.78	60.2	2.1	48.23	56.9	2.1	39.43	49.6
3.3	12.96	58.7	3.2	60.32	60.1	3.1	47.87	56.7	3.1	39.26	49.3
4 3	12.54	58.9	4.2	59.86	60.1	4.1	47.52	56.5	4.1	39.09	49.0
5.3	12.11	59.0	5.2	59.41	60.1	5.1	47.20	56.3	5.0	38.93	48.8
6.3	11.67	59.1	6.2	58.98	59.9	6.1	46.89	56.1	6.0	38.77	48.5
7.3	11.23	59.2	7.2	58.57	59.9	7.1	46.59	55.9	7.0	38.60	48.2
8.3	10.80	59.3	8.2	58.17	59.8	8.1	46.29	55.7	8.0	38.42	48.0
9.3	10.38	59.3	9.2	57.78	59.7	9.1	45.97	55.5	9.0	38.23	47.7
10.3	9.98	59.4	10.2	57.40	59.6	10.1	45.64	55.3	10.0	38.03	47.4
11.3	9.60	59.4	11.2	57.02	59.6	11.1	45.30	55.2	11.0	37.83	47.1
12.3	9.23	59.5	12.2	56.63	59.5	12.1	44.95	55.0	12.0	37.65	46.7
13.3	8.85	59.6	13.2	56.23	59.5	13.1	44.59	54.8	13.0	37.49	46.4
14.3	8.47	59.6	14.2	55.82	59.4	14.1	44.24	54.5	14.0	37.34	46.0
15.3	8.07	59.7	15.2	55.40	59.4	15.1	43.90	54.3	15.0	37.21	45.7
16.3	7.66	59.8	16.2	54.96	59.3	16.1	43.57	54.0	16.0	37.11	45.3
17.3	7.23	59.9	17.2	54.51	59.2	17.1	43.26	53.7	17.0	37.02	45.0
18.3	6.79	60.0	18.2	54.07	59.1	18.1	42.98	53.4	18.0	36.94	44.7
19.3	6.33	60.1	19.2	53.65	58.9	19.1	42.72	53.2	19.0	36.86	44.4
20.3	5.87	60.1	20.2	53.24	58.8	20.1	42.46	52.9	20.0	36.78	44.1
21.3	5.41	60.1	21.2	52.84	58.6	21.1	42.21	52.7	21.0	36.70	43.8
22.3	4.96	60.1	22.2	52.45	58.5	22.1	41.96	52.4	22.0	36.60	43.5
23.2	4.52	60.1	23.2	52.08	58.3	23.1	41.70	52.2	23.0	36.49	43.2
24.2	4.10	60.1	24.2	51.72	58.2	24.1	41.43	52.0	24.0	36.39	42.9
25.2	3.70	60.1	25.2	51.35	58.1	25.1	41.15	51.7	25.0	36.30	42.5
26.2	3.31	60.1	26.2	50.98	58.0	26.1	40.87	51.5	26.0	36.22	42.2
27.2	2.92	60.1	27.2	50.60	57.9	27.1	40.60	51.2	27.0	36.16	41.8
28.2	2.52	60.1	28.2	50.20	57.8	28.1	40.33	50.9	28 0	36.13	41.4
29.2	2.11	60.1	29.2	49.80	57.6	29.1	40.07	50.6	29.0	36.12	41.0
30.2	1.68	60.1	30.2	49.40	57.5	30.1	39.83	50.3	30.0	36.12	40.7
31.2	1.23	60.2	31.1	49.00	57.3	31.1	39.62	50.0	31.0	36.14	40.3
32.2	0.78	60.2	32.1	48.61	57.1	32.1	39.43	49.6	32.0	36.17	40.0

λ URSÆ MINORIS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	JANUARY.		Mean Solar Date.	FEBRUARY.		Mean Solar Date.	MARCH.		Mean Solar Date.	APRIL.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 19 40	° ′ +88 56		h m 19 40	° ′ +88 56		h m 19 40	° ′ +88 56		h m 19 41	° ′ +88 56
	s	″		s	″		s	″		s	″
1.1	39.89	65.8	1.0	35.51	55.9	1.9	51.42	48.1	1.8	23.20	43.5
2.1	39.36	65.6	2.0	35.68	55.7	2.9	52.24	47.8	2.8	24.49	43.4
3.1	38.80	65.3	3.0	35.92	55.4	3.9	53.14	47.5	3.8	25.76	43.4
4.0	38.24	65.0	4.0	36.23	55.1	4.9	54.11	47.3	4.8	27.01	43.4
5.0	37.71	64.7	5.0	36.62	54.8	5.9	55.13	47.0	5.8	28.21	43.4
6.0	37.24	64.4	6.0	37.08	54.4	6.9	56.17	46.8	6.8	29.35	43.4
7.0	36.84	64.0	7.0	37.60	54.1	7.9	57.21	46.7	7.8	30.44	43.4
8.0	36.55	63.7	8.0	38.14	53.8	8.9	58.22	46.5	8.8	31.48	43.4
9.0	36.35	63.3	8.9	38.67	53.5	9.9	59.19	46.4	9.8	32.49	43.4
10.0	36.21	63 0	9.9	39.16	53.3	10.9	60.12	46.2	10.8	33.52	43.4
11.0	36.10	62.7	10.9	39.62	53.0	11.9	61.00	46.1	11.8	34.57	43.4
12.0	35.98	62.4	11.9	40.04	52.8	12.9	61.85	45.9	12.8	35.67	43.4
13.0	35 83	62.1	12.9	40.43	52.5	13.9	62.70	45.7	13.8	36.82	43.3
14.0	35.66	61.8	13.9	40.81	52.2	14.9	63.57	45.5	14.8	38.03	43.3
15.0	35.45	61.5	14.9	41.20	51.9	15.9	64.48	45.4	15.8	39.27	43.4
16.0	35.21	61.2	15.9	41.64	51.6	16.9	65.46	45.2	16.8	40.52	43.4
17.0	34.95	60.9	16.9	42.15	51.3	17.8	66.53	45.0	17.8	41.79	43.5
18.0	34.68	60.6	17.9	42.74	51.0	18.8	67.65	44.8	18.8	43.01	43.5
19.0	34.45	60.2	18.9	43.41	50.7	19.8	68.82	44.7	19.8	44.16	43.6
20.0	34.28	59.9	19.9	44.14	50.4	20.8	70.01	44.6	20.8	45.25	43.7
21.0	34.19	59.5	20.9	44.93	50.1	21.8	71.19	44.5	21.8	46.29	43.8
22.0	34.19	59.2	21.9	45.72	49.9	22.8	72.32	44.4	22.8	47.30	43.9
23.0	34.27	58.8	22.9	46.50	49.6	23.8	73.41	44.3	23.7	48.30	44.0
24.0	34.42	58.5	23.9	47.25	49.4	24.8	74.45	44.3	24.7	49.31	44.0
25.0	34.61	58.2	24.9	47.96	49.2	25.8	75.45	44.2	25.7	50.35	44.1
26.0	34.80	57.9	25.9	48.64	49.0	26.8	76.43	44.1	26.7	51.43	44.2
27.0	34.97	57.6	26.9	49.31	48.8	27.8	77.43	44.0	27.7	52.58	44.2
28.0	35.11	57.3	27.9	49.98	48.6	28.8	78.47	43.9	28.7	53.78	44.3
29.0	35.22	56.9	28.9	50.67	48.3	29.8	79.56	43.8	29.7	55.00	44.4
30.0	35.31	56.6	29.9	51.42	48.1	30.8	80.72	43.7	30.7	56.21	44.5
31.0	35.40	56.2	30.9	52.24	47.8	31.8	81.94	43.6	31.7	57.39	44.7
32.0	35.51	55.9	31.9	53.14	47.5	32 8	83.20	43.5	32.7	58.52	44.8

λ URSÆ MINORIS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	MAY.		Mean Solar Date.	JUNE.		Mean Solar Date.	JULY.		Mean Solar Date.	AUGUST.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
	19 41	+88 56		19 42	+88 56		19 42	+88 57		19 42	+88 57
	s	″		s	″		s	″		s	″
1.7	57.39	44.7	1.6	24.41	51.1	1.6	35.16	0.3	1.5	28.01	10.6
2.7	58.52	44.8	2.6	24.92	51.4	2.6	35.13	0.6	2.5	27.56	10.9
3.7	59.58	45.0	3.6	25.40	51.6	3.5	35.11	0.9	3.5	27.12	11.3
4.7	60.56	45.2	4.6	25.87	51.9	4.5	35.12	1.2	4.5	26.67	11.6
5.7	61.48	45.4	5.6	26.36	52.2	5.5	35.18	1.5	5.5	26.18	11.9
6.7	62.36	45.5	6.6	26.89	52.4	6.5	35.27	1.9	6.5	25.63	12.3
7.7	63.23	45.7	7.6	27.46	52.6	7.5	35.37	2.2	7.5	25.01	12.6
8.7	64.11	45.8	8.6	28.06	52.9	8.5	35.44	2.6	8.5	24.31	13.0
9.7	65.01	45.9	9.6	28.68	53.3	9.5	35.45	2.9	9.5	23.55	13.3
10.7	65.95	46 1	10.6	29.30	53.5	10.5	35.39	3.3	10.5	22.76	13.6
11.7	66.95	46.2	11.6	29.88	53.8	11.5	35.25	3.7	11.4	21.95	13.9
12.7	67.98	46.4	12.6	30.40	54.1	12.5	35.06	4.0	12.4	21.15	14.2
13.7	69.03	46.6	13.6	30.84	54.5	13.5	34.79	4.4	13.4	20.39	14.5
14.7	70.07	46.8	14.6	31.21	54.8	14.5	34.49	4.7	14.4	19.67	14.7
15.7	71.08	47.0	15.6	31.52	55.1	15.5	34.19	5.1	15.4	18.99	15.0
16.7	72.01	47.2	16.6	31.78	55.5	16.5	33.92	5.4	16.4	18.34	15.3
17.7	72.88	47.5	17.6	32.01	55.8	17.5	33.69	5.7	17.4	17.71	15.6
18.7	73.69	47.7	18.6	32.26	56.1	18.5	33.49	6.0	18.4	17.05	15.9
19.7	74.44	47.9	19.6	32.54	56.3	19.5	33.31	6.3	19.4	16.34	16.2
20.7	75.15	48.2	20.6	32.85	56.6	20.5	33.15	6.6	20.4	15.55	16.5
21.7	75.86	48.4	21.6	33.20	56.9	21.5	33.00	6.9	21.4	14.69	16.8
22.7	76.59	48.6	22.6	33.58	57.2	22.5	32.81	7.3	22.4	13.75	17.2
23.7	77.36	48.8	23.6	33.97	57.5	23.5	32.56	7.6	23.4	12.75	17.5
24.7	78.17	49.0	24.6	34.35	57.8	24.5	32.22	8.0	24.4	11.72	17.7
25.7	79.03	49.2	25.6	34.69	58.2	25.5	31.80	8.4	25.4	10.67	18.0
26.7	79.91	49.4	26.6	34.95	58.5	26.5	31.31	8.8	26.4	9.63	18.2
27.7	80.79	49.6	27.6	35.12	58.9	27.5	30.76	9.1	27.4	8.63	18.5
28.7	81.65	49.9	28.6	35.20	59.3	28.5	30.18	9.4	28.4	7.68	18.7
29.6	82.45	50.2	29.6	35.23	59.6	29.5	29.59	9.7	29.4	6.77	18.9
30.6	83.18	50.5	30.6	35.21	60.0	30.5	29.02	10.0	30.4	5.88	19.2
31.6	83.84	50.8	31.6	35.16	60.3	31.5	28.50	10.3	31.4	5.00	19.5
32.6	84.41	51.1	32.6	35.13	60.6	32.5	28.01	10.6	32.4	4.09	19.7

λ URSÆ MINORIS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	SEPTEMBER.		Mean Solar Date.	OCTOBER.		Mean Solar Date.	NOVEMBER.		Mean Solar Date.	DECEMBER.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m 19 41	° ′ +88 57		h m 19 40	° ′ +88 57		h m 19 40	° ′ +88 57		h m 19 39	° ′ +88 57
	s	″		s	″		s	″		s	″
1.4	64.09	19.7	1.3	88.64	25.6	1.2	46.25	27.3	1.1	68.99	24.0
2.4	63.13	20.0	2.3	87.26	25.8	2.2	44.81	27.2	2.1	67.97	23.8
3.4	62.11	20.3	3.3	85.83	26.0	3.2	43.43	27.2	3.1	67.02	23.5
4.4	61.02	20.6	4.3	84.38	26.1	4.2	42.10	27.1	4.1	66.12	23.3
5.4	59.87	20.8	5.3	82.93	26.2	5.2	40.83	27.0	5.1	65.24	23.1
6.4	58.67	21.1	6.3	81.50	26.3	6.2	39.62	26.9	6.1	64.36	22.9
7.4	57.45	21.3	7.3	80.12	26.3	7.2	38.45	26.8	7.1	63.46	22.8
8.4	56.24	21.5	8.3	78.81	26.4	8.2	37.28	26.8	8.1	62.52	22.6
9.4	55.07	21.7	9.3	77.56	26.4	9.2	36.09	26.8	9.1	61.53	22.4
10.4	53.96	21.9	10.3	76.35	26.5	10.2	34.86	26.7	10.1	60.50	22.2
11.4	52.87	22.1	11.3	75.16	26.6	11.2	33.57	26.7	11.1	59.45	22.0
12.4	51.83	22.3	12.3	73.95	26.7	12.2	32.22	26.6	12.1	58.41	21.7
13.4	50.82	22.5	13.3	72.68	26.8	13.2	30.83	26.6	13.1	57.39	21.5
14.4	49.80	22.7	14.3	71.35	26.9	14.2	29.42	26.5	14.1	56.43	21.2
15.4	48.75	22.9	15.3	69.97	27.0	15.2	28.01	26.4	15.1	55.54	20.9
16.3	47.64	23.1	16.3	68.52	27.1	16.2	26.63	26.2	16.1	54.74	20.7
17.3	46.46	23.4	17.3	67.02	27.1	17.2	25.32	26.1	17.1	54.01	20.4
18.3	45.21	23.6	18.3	65.50	27.2	18.2	24.08	25.9	18.1	53.33	20.1
19.3	43.89	23.8	19.3	64.00	27.2	19.2	22.91	25.8	19.1	52.68	19.9
20.3	42.54	24.0	20.3	62.53	27.2	20.2	21.79	25.6	20.1	52.02	19.6
21.3	41.17	24.1	21.2	61.12	27.2	21.2	20.70	25.5	21.1	51.34	19.4
22.3	39.81	24.3	22.2	59.77	27.2	22.2	19.63	25.4	22.1	50.63	19.2
23.3	38.47	24.5	23.2	58.47	27.2	23.2	18.53	25.3	23.1	49.88	18.9
24.3	37.19	24.6	24.2	57.21	27.2	24.2	17.39	25.2	24.1	49.11	18.7
25.3	35.97	24.7	25.2	55.96	27.2	25.2	16.20	25.1	25.1	48.33	18.4
26.3	34.78	24.8	26.2	54.70	27.2	26.2	14.98	24.9	26.1	47.58	18.2
27.3	33.61	25.0	27.2	53.40	27.3	27.2	13.73	24.8	27.1	46.88	17.9
28.3	32.43	25.1	28.2	52.05	27.3	28.2	12.48	24.6	28.1	46.26	17.5
29.3	31.22	25.3	29.2	50.64	27.3	29.1	11.26	24.4	29.1	45.72	17.2
30.3	29.96	25.5	30.2	49.19	27.3	30.1	10.09	24.2	30.1	45.25	16.9
31.3	28.64	25.6	31.2	47.72	27.3	31.1	8.99	24.0	31.1	44.85	16.6
32.3	27.26	25.8	32.2	46.25	27.3	32.1	7.97	23.8	32.1	44.50	16.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Andromedæ.		γ Pegasi. (*Algenib.*)		β Hydri.		12 Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 0 2	° ′ +28 26	h m 0 7	° ′ +14 31	h m 0 19	° ′ −77 54	h m 0 24	° ′ −4 36
	s	″	s	″	s	″	s	″
(Dec. 30.3)	18.32 −.14	34.9 −0.8	10.53 −.12	49.0 −0.8	30.81 −.96	82.1 +0.7	1.92 −.12	30.9 −0.7
Jan. 9.2	18.19 .14	34.0 1.1	10.41 .12	48.2 0.9	29.87 .91	81.1 1.3	1.80 .12	31.5 0.6
19.2	18.05 .13	32.8 1.3	10.30 .11	47.2 1.0	29.00 .83	79.5 1.9	1.69 .11	32.1 0.5
29.2	17.93 .11	31.3 1.5	10.20 .10	46.2 1.1	28.21 .74	77.3 2.4	1.58 .10	32.5 0.4
Feb. 8.1	17.83 .09	29.8 1.6	10.11 .08	45.1 1.1	27.52 .63	74.7 2.8	1.49 .08	32.8 −0.2
18.1	17.75 .06	28.1 1.7	10.04 .05	44.1 1.0	26.95 .50	71.7 3.2	1.42 .06	32.9 0.0
28.1	17.71 −.03	26.5 1.6	10.00 −.02	43.1 0.9	26.52 .36	68.4 3.5	1.37 .04	32.9 +0.2
Mar. 10.0	17.70 +.01	24.9 1.5	10.00 +.01	42.3 0.8	26.23 .21	64.7 3.7	1.34 −.01	32.6 0.4
20.0	17.73 .05	23.5 1.3	10.02 .05	41.6 0.5	26.10 −.06	61.0 3.8	1.35 +.03	32.1 0.6
30.0	17.80 .10	22.2 1.1	10.09 .09	41.2 −0.3	26.12 +.10	57.2 3.8	1.40 .07	31.4 0.9
Apr. 9.0	17.93 .15	21.3 0.8	10.20 .13	41.0 0.0	26.30 .26	53.4 3.8	1.49 .11	30.4 1.1
19.0	18.10 .19	20.7 −0.4	10.35 .17	41.2 +0.3	26.64 .42	49.7 3.6	1.61 .15	29.2 1.3
28.9	18.31 .23	20.4 0.0	10.54 .21	41.7 0.6	27.13 .56	46.2 3.4	1.78 .19	27.7 1.5
May 8.9	18.56 .27	20.6 +0.3	10.77 .24	42.4 0.9	27.76 .70	42.9 3.1	1.98 .22	26.1 1.7
18.9	18.84 .30	21.1 0.7	11.03 .27	43.5 1.2	28.52 .82	39.9 2.8	2.22 .25	24.3 1.9
28.8	19.16 .32	22.0 1.1	11.32 .30	44.9 1.5	29.39 .92	37.4 2.4	2.49 .28	22.3 2.0
June 7.8	19.49 .34	23.3 1.4	11.62 .31	46.5 1.7	30.36 1.00	35.2 1.9	2.78 .30	20.3 2.0
17.8	19.83 .34	24.9 1.8	11.94 .32	48.3 1.9	31.39 1.06	33.6 1.4	3.08 .31	18.3 2.0
27.7	20.17 .34	26.8 2.0	12.25 .32	50.3 2.0	32.46 1.08	32.5 0.8	3.39 .31	16.2 2.0
July 7.7	20.50 .33	28.9 2.2	12.57 .31	52.4 2.1	33.55 1.08	31.9 +0.3	3.70 .30	14.3 1.9
17.7	20.82 .30	31.2 2.4	12.86 .29	54.5 2.1	34.62 1.05	31.9 −0.3	4.00 .29	12.5 1.7
27.7	21.11 .28	33.6 2.5	13.14 .27	56.6 2.1	35.64 .98	32.6 0.9	4.28 .27	10.9 1.5
Aug. 6.6	21.37 .24	36.1 2.5	13.39 .23	58.7 2.0	36.58 .89	33.7 1.4	4.53 .24	9.4 1.3
16.6	21.60 .21	38.6 2.5	13.61 .20	60.7 1.9	37.40 .76	35.4 1.9	4.76 .21	8.2 1.1
26.6	21.79 .17	41.0 2.4	13.79 .16	62.5 1.8	38.10 .62	37.5 2.3	4.96 .18	7.3 0.8
Sept. 5.6	21.93 .13	43.4 2.3	13.94 .13	64.2 1.6	38.63 .45	40.1 2.7	5.11 .14	6.7 0.5
15.5	22.04 .09	45.6 2.1	14.04 .09	65.6 1.4	38.99 .26	42.9 3.0	5.23 .10	6.3 +0.2
25.5	22.10 .05	47.6 1.9	14.11 .05	66.9 1.1	39.16 +.08	45.9 3.1	5.31 .07	6.2 0.0
Oct. 5.5	22.13 +.01	49.4 1.7	14.14 +.02	67.9 0.9	39.14 −.12	49.0 3.1	5.36 +.03	6.4 −0.2
15.4	22.12 −.03	51.0 1.5	14.14 −.02	68.7 0.7	38.93 .30	52.1 3.0	5.38 .00	6.7 0.4
25.4	22.08 .05	52.3 1.2	14.11 .04	69.3 0.5	38.54 .47	55.0 2.8	5.36 −.03	7.2 0.6
Nov. 4.4	22.02 .08	53.4 0.9	14.06 .07	69.6 +0.2	37.98 .63	57.7 2.5	5.31 .05	7.9 0.7
14.4	21.92 .10	54.2 0.6	13.98 .09	69.8 0.0	37.29 .75	59.9 2.0	5.25 .07	8.7 0.8
24.3	21.81 .12	54.6 +0.3	13.89 .10	69.7 −0.2	36.48 .86	61.7 1.5	5.17 .09	9.5 0.8
Dec. 4.3	21.69 .13	54.7 0.0	13.78 .11	69.4 0.4	35.58 .92	62.9 0.9	5.07 .10	10.3 0.8
14.3	21.55 .14	54.6 −0.4	13.67 .12	68.9 0.6	34.63 .96	63.6 −0.3	4.96 .11	11.2 0.8
24.3	21.41 .14	54.0 0.7	13.55 .12	68.3 0.7	33.67 .96	63.6 +0.3	4.85 .11	11.9 0.8
34.2	21.27 −.14	53.2 −0.9	13.43 −.12	67.5 −0.9	32.71 −.93	63.0 +0.9	4.73 −.10	12.7 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cassiopeæ.		β Ceti.		21 Cassiopeæ.		ε Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 0 33	° ′ +55 53	h m 0 37	° ′ −18 37	h m 0 37	° ′ +74 20	h m 0 56	° ′ +7 15
	s	″	s	″	s	″	s	″
(Dec. 30.3)	50.56 −.28	45.7 −0.2	40.89 −.13	66.6 −0.6	54.68 −.69	59.1 +0.2	50.35 −.12	22.8 −0.7
Jan. 9.2	50.28 .28	45.3 0.7	40.76 .13	67.1 0.4	53.98 .70	59.0 −0.4	50.23 .12	22.1 0.7
19.2	50.00 .27	44.3 1.2	40.63 .13	67.3 −0.1	53.29 .68	58.4 1.0	50.11 .12	21.3 0.7
29.2	49.73 .25	42.9 1.6	40.51 .12	67.4 +0.1	52.64 .63	57.1 1.5	49.99 .12	20.6 0.7
Feb. 8.1	49.49 .23	41.1 2.0	40.40 .10	67.1 0.4	52.04 .56	55.4 2.0	49.88 .11	19.9 0.7
18.1	49.28 .18	38.9 2.3	40.30 .08	66.6 0.7	51.52 .46	53.1 2.4	49.78 .09	19.2 0.6
28.1	49.13 .13	36.5 2.5	40.24 .06	65.8 0.9	51.12 .34	50.5 2.7	49.70 .07	18 7 0.5
Mar. 10.1	49.03 −.07	34.0 2.6	40.19 −.03	64.7 1.2	50.84 .21	47.7 2.9	49.64 −.04	18.3 0.3
20.0	49.00 .00	31.4 2.6	40.19 +.01	63.4 1.4	50.71 −.06	44.7 3.0	49.62 .00	18.1 −0.1
30.0	49.04 +.08	28.9 2.4	40.22 .05	61.8 1.7	50.73 +.10	41.6 3.0	49.64 +.04	18.1 +0.1
Apr. 9.0	49.16 .15	26.5 2.2	40.28 .09	60.0 1.9	50.90 .25	38.7 2.8	49.70 .08	18.3 0.4
19.0	49.35 .23	24.5 1.9	40.40 .13	58.1 2.1	51.22 .40	36.0 2.6	49.79 .12	18.8 0.6
28.9	49.61 .29	22 8 1.5	40.55 .17	55.9 2.2	51.68 .53	33.6 2.2	49.94 .16	19.6 0.8
May 8.9	49.93 .35	21.5 1.1	40.74 .21	53.7 2.3	52.27 .65	31.7 1.8	50.12 .20	20.6 1.1
18.9	50.31 .40	20.6 0.6	40.98 .25	51.3 2.4	52.97 .75	30.2 1.3	50.34 .24	21.8 1.4
28.9	50.74 .44	20.3 −0.1	41 24 .28	49.0 2.3	53.76 .82	29.1 0.8	50.59 .27	23.3 1.6
June 7.8	51.19 .47	20.4 +0.4	41.53 .30	46.7 2.3	54.61 .87	28.6 −0.2	50.87 .29	25.0 1.7
17.8	51.67 .49	21.1 0.9	41.83 .31	44.5 2.1	55.50 .91	28.7 +0.4	51.17 .30	26.7 1.8
27.8	52.16 .49	22.2 1.3	42.15 .32	42.4 2.0	56.41 .91	29.4 0.9	51.48 .31	28.6 1.9
July 7.7	52.64 .47	23.7 1.8	42.47 .32	40.6 1.7	57.31 .89	30.5 1.4	51.79 .31	30.6 1.9
17.7	53.10 .45	25.7 2.2	42.78 .31	39.0 1.4	58.17 .85	32.2 1.9	52.10 .30	32.5 1.9
27.7	53.54 .42	28.0 2.5	43.07 .29	37.7 1.1	58.99 .78	34.3 2.3	52.39 .28	34.4 1.8
Aug. 6.7	53.94 .38	30.6 2.8	43.35 .26	36.7 0.8	59.74 .71	36.8 2.7	52.66 .26	36.1 1.7
16.6	54.30 .33	33.5 3.0	43.59 .23	36.1 0.4	60.40 .62	39.7 3.0	52.91 .23	37.7 1.5
26.6	54.60 .28	36.6 3.1	43.81 .19	35.8 +0.1	60.98 .52	42.8 3.3	53.13 .20	39.2 1.3
Sept. 5.6	54.85 .22	39.7 3.2	43.98 .16	35.9 −0.3	61.45 .42	46.2 3.5	53.32 .17	40.4 1.1
15.5	55.04 .17	42.9 3.2	44.12 .12	36.3 0.6	61.81 .31	49.8 3.6	53.47 .14	41.4 0.9
25.5	55.18 .11	46.1 3.1	44.22 .08	37.1 0.9	62.06 .19	53.4 3.6	53.59 .10	42.2 0.7
Oct. 5.5	55.26 +.05	49.2 3.0	44.28 .04	38.1 1.1	62.18 +.07	57.0 3.6	53.67 .07	42.8 0.4
15.5	55.28 .00	52.2 2.9	44.30 +.01	39.2 1.3	62.20 −.05	60.5 3.5	53.72 .04	43.1 +0.2
25.4	55.25 −.06	54.9 2.6	44.29 −.03	40.5 1.4	62.09 .16	64.0 3.3	53.74 +.01	43.2 0.0
Nov. 4.4	55.17 .11	57.4 2.3	44.24 .06	41.9 1.4	61.87 .28	67.1 3.0	53.73 −.02	43.2 −0.1
14.4	55.04 .15	59.6 2.0	44.18 .08	43.3 1.4	61.54 .38	70.0 2.7	53.70 .04	42.9 0.3
24.3	54.87 .19	61.3 1.6	44.09 .10	44.7 1.3	61.11 .48	72.5 2.3	53.64 .07	42.6 0.4
Dec. 4.3	54.66 .23	62.7 1.1	43.99 .11	45.9 1.2	60.58 .56	74.5 1.8	53.56 .08	42.1 0.5
14.3	54.42 .25	63.6 0.6	43.87 .12	47.0 1.0	59.99 .63	76.0 1.2	53.47 .10	41.5 0.6
24.3	54.16 .27	63.9 +0.1	43.74 .13	47.9 0.8	59.34 .67	77.0 +0.6	53.36 .11	40.9 0.7
34.2	53.88 −.28	63.8 −0.4	43.61 −.13	48.6 −0.6	58.65 −.70	77.3 0.0	53.25 −.12	40.2 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		θ¹ Ceti.		38 Cassiopeæ.		η Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 3	+34° 59′	h m 1 18	−8° 47′	h m 1 22	+69° 39′	h m 1 25	+14° 44′
	s	″	s	″	s	″	s	″
(Dec. 30.3)	9.15 −.15	56.0 −0.2	8.71 −.12	33.1 −0.7	30.85 −.47	46.8 +0.7	11.63 −.09	21.8 −0.6
Jan. 9.3	8.99 .16	55.6 0.6	8.59 .12	33.9 0.6	30.36 .50	47.2 +0.1	11.51 .12	21.2 0.7
19.2	8.83 .17	54.8 0.9	8.46 .13	34.5 0.5	29.84 .52	47.0 −0.5	11.38 .13	20.5 0.8
29.2	8.66 .16	53.7 1.2	8.33 .13	34.9 0.3	29.32 .51	46.3 1.0	11.24 .13	19.7 0.8
Feb. 8.2	8.51 .15	52.4 1.4	8.21 .12	35.1 −0.1	28.83 .47	45.0 1.5	11.11 .13	18.9 0.8
18.1	8.37 .13	50.9 1.6	8.09 .11	35.1 +0.1	28.38 .42	43.2 2.0	10.99 .11	18.0 0.8
28.1	8.25 .10	49.2 1.7	7.99 .09	34.9 0.3	27.99 .35	41.0 2.4	10.88 .09	17.2 0.8
Mar. 10.1	8.17 .06	47.5 1.7	7.92 .06	34.5 0.6	27.68 .25	38.5 2.6	10.80 .07	16.5 0.7
20.1	8.13 −.02	45.8 1.6	7.87 −.03	33.8 0.8	27.48 .15	35.8 2.8	10.75 −.03	15.9 0.5
30.0	8.14 +.03	44.2 1.5	7.86 +.01	32.9 1.1	27.39 −.03	33.0 2.8	10.74 +.01	15.4 0.4
Apr. 9.0	8.20 .08	42.8 1.3	7.89 .05	31.7 1.3	27.42 +.09	30.1 2.8	10.77 .05	15.2 −0.1
19.0	8.31 .14	41.7 1.0	7.96 .09	30.3 1.5	27.57 .21	27.4 2.6	10.84 .10	15.1 +0.1
29.0	8.48 .19	40.8 0.7	8.08 .14	28.7 1.7	27.83 .32	24.9 2.3	10.97 .14	15.4 0.4
May 8.9	8.69 .24	40.3 −0.3	8.24 .18	26.9 1.9	28.22 .43	22.7 2.0	11.13 .18	15.9 0.6
18.9	8.95 .28	40.2 0.0	8.43 .21	25.0 2.0	28.70 .52	20.9 1.6	11.34 .22	16.7 0.9
28.9	9.24 .31	40.4 +0.4	8.66 .25	22.9 2.1	29.26 .60	19.6 1.2	11.58 .26	17.7 1.2
June 7.8	9.57 .34	41.0 0.8	8 92 .27	20.8 2.1	29.90 .66	18.7 0.7	11.85 .28	19.0 1.4
17.8	9.92 .35	42.0 1.1	9.21 .29	18.7 2.1	30.59 .71	18.3 −0.1	12.14 .30	20.5 1.6
27.8	10 28 .36	43.3 1.4	9.51 .30	16.6 2.0	31.31 .73	18.4 +0.4	12.46 .31	22.1 1.7
July 7.8	10.64 .36	44.9 1.7	9.82 .31	14.6 1.9	32.05 .73	19.1 0.9	12.77 .32	23.9 1.8
17.7	11.00 .35	46.8 2.0	10.12 .30	12.8 1.7	32.78 .72	20.3 1.4	13.09 .31	25.7 1.9
27.7	11.34 .33	48.8 2.1	10.42 .29	11.2 1.5	33.49 .69	21.9 1.8	13.40 .30	27.6 1.8
Aug. 6.7	11.66 .31	51.0 2.3	10.70 .27	9.8 1.2	34.16 .65	23.9 2.2	13.69 .28	29.4 1.8
16.6	11.95 .28	53.4 2.4	10.96 .25	8.7 0.9	34.79 .60	26.3 2.6	13.96 .26	31.2 1.7
26.6	12.21 .24	55.7 2.4	11.20 .22	7.9 0 6	35.36 .54	29.0 2.9	14.20 .23	32.8 1.6
Sept. 5.6	12.43 .20	58.1 2.4	11.40 .19	7.5 +0.3	35.85 .46	32.0 3.1	14.42 .20	34.4 1.4
15.6	12.62 .16	60.5 2.3	11.57 .15	7.3 0.0	36.27 .38	35.2 3.3	14.60 .17	35.7 1.2
25.5	12.76 .12	62.7 2.2	11.71 .12	7.5 −0.3	36.61 .29	38.5 3.4	14.75 .13	36.8 1.1
Oct. 5.5	12.86 .08	64.8 2.0	11.80 .08	7.9 0.6	36.86 .21	41.9 3.4	14.86 .10	37.8 0.9
15.5	12.93 .05	66.8 1.9	11.87 .05	8.6 0.8	37.02 .12	45.3 3.4	14.95 .07	38.6 0.7
25.5	12.96 +.01	68.5 1.6	11.91 +.02	9.4 0.9	37.10 +.02	48.6 3.3	15.00 .04	39.1 0.5
Nov. 4.4	12.96 −.02	70.1 1.4	11.91 −.01	10.5 1.1	37.07 − 07	51.8 3.1	15.02 +.01	39.5 0.3
14.4	12.92 .05	71.4 1.1	11.89 .04	11.6 1.1	36.96 .16	54.7 2.8	15.01 −.02	39.6 +0.1
24.4	12.85 .08	72.4 0.9	11.84 .06	12.7 1.1	36.76 .24	57.4 2.5	14.98 .05	39.6 −0.1
Dec. 4.3	12.76 .10	73.1 0.5	11.77 .08	13.8 1.1	36.47 .32	59.7 2.0	14.92 .07	39.5 0.2
14.3	12.64 .13	73.4 +0.2	11.68 .10	14.9 1.0	36.12 .39	61.5 1 6	14.84 .10	39.2 0.4
24.3	12.51 .15	73.5 −0.1	11.57 .11	15.9 0.9	35.69 .45	62.8 1.1	14.74 .11	38.8 0.5
34.3	12.35 −.16	73.2 −0.4	11.46 −.12	16.8 −0.8	35.22 −.50	63.6 +0.5	14.63 −.12	38.2 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Eridani. (*Achernar.*)		o Piscium.		β Arietis.		50 Cassiopeæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 33	° ′ −57 49	h m 1 39	° ′ +8 33	h m 1 48	° ′ +20 13	h m · 1 53	° ′ +71 50
	s	″	s	″	s	″	s	″
(Dec. 30.3)	19.82 −.33	84.7 −0.7	11.25 −.10	53.3 −0.7	8.99 −.11	59.6 −0.4	26.62 −.50	79.3 +1.1
Jan. 9.3	19.48 .34	85.2 −0.2	11.14 .12	52.6 0.7	8.87 .13	59.2 0.6	26.10 .55	80.2 +0.5
19.2	19.14 .34	85.1 +0.4	11.01 .13	52.0 0.7	8.73 .14	58.5 0.7	25.52 .58	80.5 0.0
29.2	18.80 .33	84.4 0.9	10.88 .13	51.2 0.7	8.59 .14	57.8 0.8	24.93 .59	80.2 −0.6
Feb. 8.2	18.47 .31	83.3 1.4	10.74 .13	50.6 0.6	8·44 .14	57.0 0.9	24.34 .57	79.3 1.1
18.1	18.17 .28	81.6 1.9	10.62 .12	50.0 0.6	8.31 .13	56.1 0.9	23.79 .53	77.9 1.6
28.1	17.91 .25	79.4 2.3	10.51 .10	49.4 0.5	8.18 .12	55.1 0.9	23.29 .46	76.0 2.1
Mar. 10.1	17.68 .20	76.9 2.7	10.42 .08	49.0 0.3	8.08 .09	54.2 0.9	22.87 .37	73.8 2.4
20.1	17.51 .14	74.0 3.0	10.36 −.04	48.8 −0.2	8.00 .05	53.3 0.8	22.55 .26	71.2 2.7
30.0	17.40 .08	70.8 3.3	10.33 .00	48.6 0.0	7.97 −.01	52.6 0.7	22.36 −.13	68.4 2.8
Apr. 9.0	17.35 −.01	67.5 3.4	10.35 +.04	48.8 +0.2	7.98 +.03	52.0 0.5	22.29 .00	65.6 2.8
19.0	17.37 +.05	64.0 3.5	10.40 .08	49.1 0.5	8.03 .08	51.6 −0.3	22.36 +.14	62.8 2.7
29.0	17.46 .13	60.4 5.5	10.50 .12	49.6 0.7	8.13 .12	51.4 0.0	22.56 .27	60.1 2.6
May 8.9	17.62 .20	56.9 3.5	10.65 .17	50.5 0.9	8.28 .17	51.6 +0.3	22.90 .40	57.6 2.3
18.9	17.85 .26	53.5 3.3	10.84 .21	51.5 1.2	8.47 .21	52.0 0.5	23.35 .51	55.5 1.9
28.9	18.14 .32	50.2 3.1	11.07 .24	52.8 1.4	8.70 .25	52.6 0.8	23.91 .61	53.8 1.5
June 7.8	18.49 .37	47.2 2.8	11.32 .27	54.3 1.5	8.97 .28	53.6 1.1	24.57 .69	52.5 1.1
17.8	18.88 .41	44.6 2.5	11.61 .29	55.9 1.7	9.26 .30	54.7 1.3	25.29 .75	51.7 0.6
27.8	19.31 .44	42.3 2.0	11.91 .30	57.6 1.8	9.57 .32	56.1 1.5	26.07 .79	51.4 −0.1
July 7.8	19.77 .47	40.5 1.6	12.21 .31	59.4 1.8	9.90 .32	57.6 1.6	26.87 .81	51.5 +0.4
17.7	20.24 .47	39.2 0.5	12.53 .31	61.3 1.8	10.22 .32	59.3 1.7	27.69 .81	52.2 0.9
27.7	20.71 .46	38.4 +0.5	12.83 .30	63.1 1.8	10.54 .31	61.1 1.8	28.50 .80	53.3 1.4
Aug. 6.7	21.16 .44	38.3 −0.1	13.12 .28	64.8 1.6	10.85 .30	62.9 1.8	29.29 .77	54.9 1.8
16.7	21.59 .41	38.6 0.7	13.39 .26	66.3 1.5	11.14 .28	64.7 1.8	30.04 .72	56.9 2.2
26.6	21.98 .36	39.6 1.2	13 64 .23	67.8 1.3	11.40 .25	66.4 1.7	30.73 .66	59.3 2.5
Sept. 5.6	22.32 .31	41.1 1.7	13.86 .21	69.0 1.1	11.64 .22	68.0 1.6	31.36 .59	62.0 2.8
15.6	22.60 .25	43.0 2.2	14.05 .17	70.0 0.9	11.85 .19	69.5 1.4	31.91 .51	64.9 3.1
25.5	22.81 .18	45.4 2.5	14.21 .14	70.8 0.7	12.02 .16	70.9 1.3	32.37 .42	68.1 3.2
Oct. 5.5	22.96 .11	48.1 2.8	14.34 .11	71.3 0.5	12.17 .13	72.1 1.1	32.75 .33	71.4 3.3
15.5	23.04 +.04	51.0 2.9	14.43 .08	71.7 0.3	12.28 .10	73.1 0.9	33.03 .23	74.7 3.4
25.5	23.04 −.03	54.0 3.0	14.49 .05	71.8 +0.1	12.36 .06	74.0 0.8	33.21 .13	78.0 3.3
Nov. 4.4	22 98 .09	56.9 2.9	14.53 +.02	71.8 −0.1	12.40 +.03	74.7 0.6	33.28 +.02	81.3 3.2
14.4	22.85 .15	59.8 2.7	14.53 −.01	71.6 0.2	12.42 .00	75.1 0.4	33.25 −.09	84.4 3.0
24.4	22.67 .21	62.4 2.6	14.51 .03	71.3 0.4	12.41 −.03	75.4 +0.2	33.11 .19	87.4 2.7
Dec. 4.4	22.44 .25	64.7 2.1	14.47 .06	70.9 0.5	12.37 .05	75.6 0.0	32.86 .29	89.9 2.4
14.3	22.16 .29	66.6 1.6	14.40 .08	70.3 0.6	12.30 .08	75.5 −0.1	32.53 .38	92.1 2.0
24.3	21.86 .32	67.9 1.1	14.31 .10	69.7 0.6	12.21 .10	75.3 0.3	32.10 .46	93.8 1.5
34.3	21.53 −.34	68.8 −0.6	14.20 −.12	69.1 −0.7	12.10 −.12	74.9 −0.4	31.60 −.56	95.0 +1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Arietis.		*ξ*¹ Ceti.		*ι* Cassiopeæ.		*ξ*² Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 0	° ′ +22 54	h m 2 6	° ′ +8 17	h m 2 19	° ′ +66 52	h m 2 21	° ′ +7 55
	s	″	s	″	s	″	s	″
(Dec. 30.3)	33.12 −.11	23.4 −0.3	46.41 −.10	37.8 −0.6	24.92 −.34	34.0 +1.3	54.86 −.09	53.5 −0.7
Jan. 9.3	33.00 .13	23.0 0.4	46.30 .12	37.1 0.7	24.54 .40	35.0 0.8	54.76 .11	52.8 0.7
19.2	32.86 .14	22.5 0.6	46.17 .13	36.4 0.7	24.12 .43	35.5 +0.2	54.64 .13	52.2 0.6
29.2	32.71 .15	21.8 0.8	46.04 .14	35.8 0.6	23.68 .46	35.5 −0.3	54.50 .14	51.5 0.6
Feb. 8.2	32.56 .15	20.9 0.9	45.90 .14	35.2 0.6	23.22 .45	34.9 0.8	54.35 .15	50.9 0.6
18.2	32.41 .14	20.0 1.0	45.76 .13	34.6 0.5	22.77 .43	33.8 1.3	54.21 .14	50.4 0.5
28.2	32.28 .13	19.0 1.0	45.63 .12	34.1 0.4	22.35 .39	32.2 1.8	54.07 .13	49.9 0.4
Mar. 10.1	32.16 .10	18.0 1.0	45.52 .10	33.7 0.3	21.99 .33	30.2 2.1	53.95 .11	49.5 0.3
20.1	32.08 .07	17.1 0.9	45.43 .07	33.5 −0.2	21.70 .25	27.9 2.4	53.85 .08	49.3 −0.1
30.1	32.03 −.03	16.2 0.8	45.38 −.03	33.4 0.0	21.50 .16	25.4 2.6	53.79 .05	49.2 0.0
Apr. 9.1	32.02 +.02	15.5 0.6	45.37 +.01	33.5 +0.2	21.40 −.05	22.8 2.6	53.76 −.01	49.3 +0.2
19.0	32.06 .07	14.9 0.4	45.40 .05	33.8 0.4	21.40 +.06	20.1 2.6	53.78 +.04	49.6 0.4
29.0	32.16 .11	14.6 −0.2	45.47 .10	34.3 0.7	21.51 .17	17.6 2.5	53.84 .08	50.2 0.6
May 9.0	32.29 .16	14.5 +0.1	45.59 .14	35.1 0.9	21.74 .27	15.2 2.2	53.94 .13	50.9 0.9
18.9	32.48 .21	14.7 0.3	45.76 .18	36.1 1.1	22.06 .37	13.1 1.9	54.09 .17	51.9 1.1
28.9	32.71 .24	15.2 0.6	45.96 .22	37.3 1.3	22.48 .46	11.3 1.6	54.28 .21	53.1 1.3
June 7.9	32.97 .28	15.9 0.9	46.20 .25	38.7 1.5	22.97 .53	9.9 1.2	54.51 .24	54.4 1.4
17.9	33.26 .30	16.9 1.1	46.47 .28	40.2 1.6	23.54 .59	8.9 0.7	54.77 .27	55.9 1.5
27.8	33.57 .32	18.1 1.3	46.76 .30	41.8 1.7	24.15 .63	8.5 −0.3	55.05 .29	57.5 1.6
July 7.8	33.90 .33	19.5 1.5	47.06 .31	43.6 1.7	24.80 .66	8.4 +0.2	55.35 .30	59.2 1.7
17.8	34.23 .33	21.1 1.6	47.37 .31	45.3 1.7	25.47 .67	8.8 0.6	55.66 .31	60.9 1.7
27.7	34.56 .32	22.7 1.7	47 68 .30	47.0 1.7	26.14 .67	9.7 1.1	55.96 .30	62.5 1.6
Aug. 6.7	34.87 .31	24.5 1.8	47.97 .29	48.6 1.6	26.80 .65	11.0 1.5	56.26 .29	64.1 1.5
16.7	35.17 .29	26.2 1.7	48.26 .27	50.1 1.4	27.44 .62	12.7 1.9	56.55 .28	65.6 1.4
26.7	35.45 .27	28.0 1.7	48 52 .25	51.5 1.2	28.04 .58	14.8 2.2	56.82 .26	66.9 1.2
Sept. 5.6	35.70 .24	29.6 1.6	48.76 .23	52.6 1.0	28.59 .53	17.1 2.5	57.07 .24	68.0 0.9
15.6	35.92 .21	31.2 1.5	48.97 .20	53.6 0.8	29.10 .47	19.7 2.7	57.29 .21	68.8 0.8
25.6	36.11 .18	32.7 1.4	49.15 .17	54.3 0.6	29.54 .41	22.6 2.9	57.49 .18	69.5 0.6
Oct. 5.6	36.27 .14	34.0 1.2	49.30 .14	54.8 0.4	29.91 .34	25.6 3.0	57.66 .15	70.0 0.3
15.5	36.40 .11	35.1 1.1	49.43 .11	55.1 +0.2	30.21 .26	28.6 3.1	57.79 .12	70.2 +0.1
25 5	36.50 .08	36.1 0.9	49.52 .08	55.1 0.0	30.43 .18	31.7 3.1	57.90 .09	70.2 −0.1
Nov. 4.5	36.56 .05	36.9 0.7	49.58 .05	55.1 −0.2	30.57 .10	34.8 3.0	57.98 .06	70.1 0.2
14.4	36.59 +.02	37.6 0.6	49.61 +.02	54.8 0.3	30.63 +.01	37.8 2.9	58.02 +.03	69.8 0.4
24.4	36.59 −.01	38.0 0.4	49.62 −.01	54.4 0.4	30.60 −.07	40.5 2.6	58.04 .00	69.4 0.5
Dec. 4.4	36.56 .04	38.3 +0.2	49.59 .04	54.0 0.5	30.49 .15	43.0 2.4	58.03 −.02	68.9 0.5
14.4	36.51 .07	38.4 0.0	49.54 .06	53.4 0.6	30.29 .23	45.2 2.0	57.99 .05	68.3 0.6
24.3	36.42 .10	38.3 −0.2	49.47 .09	52.8 0.6	30.02 .31	47.1 1.6	57.92 .08	67.7 0.6
34.3	36.32 −.12	38.1 −0.4	49.37 −.11	52.2 −0.5	29.68 −.37	48.4 +1.1	57.83 −.10	67.0 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ceti.		α Ceti.		48 Cephei (H.)		ζ Arietis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$2^{h}\ 37^{m}$	$+2^{\circ}\ 44'$	$2^{h}\ 56^{m}$	$+3^{\circ}\ 37'$	$3^{h}\ 5^{m}$	$+77^{\circ}\ 17'$	$3^{h}\ 8^{m}$	$+20^{\circ}\ 36'$
(Dec. 30.3)	$12^{s}.92$ −.09	$17''.8$ −0.8	$8^{s}.52$ −.07	$34''.9$ −0.8	$30^{s}.54$ −.55	$73''.0$ +2.1	$9^{s}.30$ −.07	$27''.9$ −0.2
Jan. 9.3	12.82 .11	17.0 0.8	8.43 .10	34.1 0.8	29.92 .68	74.8 1.6	9.21 .10	27.7 0.3
19.3	12.71 .13	16.2 0.7	8.32 .12	33.4 0.7	29.18 .78	76.1 1.0	9.10 .13	27.4 0.4
29.3	12.57 .14	15.6 0.6	8.18 .14	32.7 0.6	28.35 .85	76.9 +0.5	8.96 .15	27.0 0.5
Feb. 8.2	12.42 .15	15.0 0.5	8.04 .15	32.2 0.5	27.47 .88	77.1 −0.2	8.80 .16	26.4 0.6
18.2	12.27 .15	14.6 0.4	7.88 .15	31.7 0.4	26.58 88	76.6 0.7	8.63 .17	25.9 0.6
28.2	12.13 .14	14.3 0.2	7.73 .15	31.4 0.3	25.72 .83	75.6 1.3	8.47 .16	25.2 0.7
Mar. 10.2	12.00 .12	14.1 −0.1	7.59 .13	31.2 −0.1	24.92 .74	74.0 1.8	8.31 .15	24.5 0.7
20.1	11.89 .09	14.1 +0.1	7.46 .11	31.1 0.0	24.24 .63	72.0 2.2	8.17 .12	23.8 0.7
30.1	11.81 .06	14.3 0.3	7.37 .08	31.2 +0.2	23,67 .48	69.7 2.5	8.07 .09	23.2 0.6
Apr. 9.1	11.76 −.02	14.7 0.5	7.31 −.04	31.5 0.4	23.28 .31	67.0 2.7	8.00 −.05	22.6 0.5
19.0	11.76 +.02	15.3 0.7	7.29 .00	32.1 0.6	23.05 −.13	64.2 2.8	7.97 .00	22.2 0.4
29.0	11.80 .06	16.1 0.9	7.32 +.05	32.8 0.8	23.02 +.06	61.3 2.9	7.99 +.05	21.9 −0.2
May 9.0	11.89 .11	17.1 1.1	7.39 .09	33.7 1.0	23.18 .25	58.5 2.8	8.06 .09	21.8 0.0
19.0	12.03 .15	18.3 1.3	7.50 .14	34.8 1.2	23.52 .43	55.8 2.6	8.18 .14	21.9 +0.2
28.9	12.20 .19	19.7 1.5	7.66 .18	36.1 1.4	24.04 .60	53.3 2.3	8.34 .19	22.2 0.4
June 7.9	12.41 .23	21.3 1.6	7.86 .21	37.6 1.5	24.72 .74	51.1 2.0	8.55 .22	22.7 0.6
17.9	12.66 .26	22.9 1.7	8.09 .25	39.1 1.6	25.53 .88	49.3 1.6	8 79 .26	23.4 0.8
27.8	12.93 .28	24.6 1.7	8.35 .27	40.8 1.7	26.47 .98	47.9 1.2	9.06 .28	24.3 1.0
July 7.8	13.21 .29	26.4 1.7	8.63 .29	42.5 1.7	27.50 1.06	46.9 0.7	9.36 .30	25.4 1.1
17.8	13.51 .30	28.1 1.7	8.93 .30	44.2 1.6	28.60 1.12	46.5 −0.3	9.67 .32	26.5 1.2
27.8	13.82 .30	29.8 1.6	9.23 .30	45.8 1.5	29.73 1.15	46.4 +0.2	9.99 .32	27.8 1.3
Aug. 6.7	14.11 .29	31.3 1.4	9.53 .30	47.2 1.4	30.89 1.15	46.9 0.7	10.31 .32	29.1 1.3
16.7	14.40 .28	32.6 1.2	9.82 .29	48.6 1.2	32.04 1.14	47.8 1.1	10.62 .31	30.4 1.3
26.7	14.68 .26	33.8 1.0	10.10 .27	49.7 1.0	33.16 1.10	49.2 1.6	10.93 .30	31.8 1.3
Sept. 5.7	14.93 .24	34.7 0.8	10.36 .25	50.6 0.8	34.23 1.04	50.9 2.0	11.21 .28	33.0 1.2
15.6	15.16 .22	35 3 0 5	10.61 .23	51.2 0.5	35.24 .96	53.1 2.3	11.48 .26	34.1 1.1
25.6	15.36 .19	35.7 +0.3	10.82 .20	51.6 +0.3	36.16 .87	55.5 2.6	11.73 .23	35.2 1.0
Oct. 5.6	15.54 .16	35.8 0.0	11.02 .18	51.8 0.0	36.98 .76	58.3 2.9	11.94 .21	36.1 0.8
15.5	15.69 .13	35.8 −0.2	11.18 .15	51.7 −0.2	37.68 .64	61.3 3.1	12.14 .18	36.8 0.7
25.5	15.81 .10	35.4 0.4	11.32 .12	51.4 0.4	38.25 .50	64.4 3.2	12.30 .15	37.5 0.6
Nov. 4.5	15.90 .07	34.9 0.6	11.43 .09	50.9 0.6	38.67 .35	67.7 3.3	12.44 .12	38.0 0.5
14.5	15.95 .04	34.3 0.7	11.51 .06	50.2 0.7	38.94 .19	71.0 3.2	12.54 .09	38.4 0.3
24.4	15.98 +.01	33.5 0.8	11.56 +.03	49.5 0.8	39.04 +.02	74.2 3.1	12.61 .05	38.7 0.2
Dec. 4.4	15.98 −.02	32.7 0.8	11.57 .00	48.7 0.8	38.98 −.15	77.3 3.0	12.64 +.02	38.8 +0.1
14.4	15.95 .04	31.9 0 8	11.56 −.03	47.9 0.8	38.74 .31	80.1 2.7	12.64 −.02	38.9 0.0
24.4	15.89 .07	31.0 0.8	11.51 .06	47.0 0.8	38.34 .47	82.6 2.3	12.61 .05	38.8 −0.1
34.3	15.81 −.10	30.2 −0.8	11.44 −.09	46.2 −0.8	37.80 −.62	84.8 +1.9	12.55 −.08	38.7 −0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Persei.		ε Eridani.		δ Persei.		η Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 15	° ′ +49 26	h m 3 27	° ′ −9 51	h m 3 34	° ′ +47 24	h m 3 40	° ′ +23 44
	s	″	s	″	s	″	s	″
(Dec. 30.4)	57.16 −.11	35.6 +1.1	24.13 −.07	33.2 −1.4	34.64 −.09	41.9 +1.1	30.57 −.05	25.4 0.0
Jan. 9.3	57.02 .16	36.6 0.8	24.05 .10	34.5 1.2	34.52 .14	42.9 0.8	30.50 .08	25.4 −0.1
19.3	56.83 .20	37.2 0.4	23.93 .13	35.6 1.0	34.36 .18	43.6 0.5	30.40 .12	25.3 0.2
29.3	56.61 .24	37.4 +0.1	23.79 .15	36.4 0.7	34.16 .22	43.9 +0.2	30.26 .15	25.0 0.3
Feb. 8.2	56.36 .25	37.3 −0.3	23.63 .16	37.1 0.5	33.93 .24	43.9 −0.2	30.10 .16	24.7 0.4
18.2	56.10 .26	36.8 0.7	23.47 .17	37.4 −0.2	33.68 .25	43.6 0.5	29.93 .18	24.2 0.5
28.2	55.84 .25	35.9 1.0	23.29 .17	37.6 0.0	33.42 .25	42.8 0.9	29.75 .18	23.7 0.6
Mar. 10.2	55.60 .23	34.7 1.3	23.13 .16	37.4 +0.3	33.18 .23	41.8 1.2	29.58 .17	23.1 0.6
20.1	55.38 .19	33.2 1.6	22.98 .14	37.0 0.5	32.96 .20	40.6 1.4	29.42 .15	22.4 0.7
30.1	55.21 .15	31.6 1.7	22.85 .11	36.4 0.8	32.78 .16	39.1 1.6	29.28 .12	21.7 0.7
Apr. 9.1	55.09 .09	29.7 1.8	22 75 .08	35.4 1.0	32.65 .11	37.4 1.7	29.18 .08	21.1 0.6
19.1	55.03 −.02	27.9 1.9	22.70 −.04	34.3 1.3	32.57 −.05	35.7 1.7	29.13 −.03	20.5 0.5
29.0	55.04 +.04	26.0 1.8	22.68 +.01	32.9 1.5	32.55 +.02	34.0 1.7	29.12 +.01	20.0 0.4
May 9.0	55.12 .11	24.3 1.7	22.71 .05	31.3 1.7	32.60 .08	32.3 1.6	29.15 .06	19.6 0.3
19.0	55.26 .18	22.7 1.5	22.79 .10	29.5 1.9	32.72 .15	30.8 1.4	29.24 .11	19.5 −0.1
28.9	55.47 .24	21.4 1.2	22.91 .14	27.6 2.0	32.90 .21	29.5 1.2	29.38 .16	19.5 +0.1
June 7.9	55.74 .29	20.3 0.9	23.07 .18	25.5 2.1	33.14 .27	28.4 1.0	29.56 .20	19.7 0.3
17.9	56.06 .34	19.5 0.6	23.27 .21	23.4 2.1	33.43 .31	27.6 0.7	29.78 .24	20.0 0.5
27.9	56.43 .38	19.0 −0.3	23.50 .24	21.3 2.1	33.77 .35	27.0 0.4	30.04 .27	20.6 0.6
July 7.8	56.82 .41	18.9 0.0	23.75 .26	19.2 2.0	34.14 .38	26.8 −0.1	30.32 .29	21.3 0.8
17.8	57.24 .43	19.1 +0.4	24.03 .28	17.3 1.8	34.53 .41	26.9 +0.2	30.63 .31	22.2 0.9
27.8	57.68 .44	19.6 0.7	24.32 .29	15.6 1.6	34.95 .42	27.2 0.5	30.94 .32	23.2 1.0
Aug. 6.8	58.12 .44	20.4 1.0	24.61 .29	14.0 1.4	35.37 .42	27.9 0.8	31.27 .32	24.2 1.1
16.7	58.55 .43	21.5 1.2	24.90 .29	12.8 1.1	35.79 .42	28.8 1.0	31.59 .32	25.3 1.1
26.7	58.97 .41	22.8 1.4	25.18 .28	11.9 0.8	36.20 .41	29.9 1.2	31.91 .31	26.4 1.1
Sept. 5.7	59.38 .39	24.4 1.6	25.46 .26	11.3 +0.4	36.60 .39	31.2 1.4	32.21 .30	27.5 1.1
15.6	59.75 .36	26.1 1.8	25.71 .25	11.1 0.0	36.98 .37	32.7 1.6	32.50 .28	28.5 1.0
25.6	60.10 .33	27.9 1.9	25.95 .22	11.2 −0.3	37.34 .34	34.4 1.7	32.78 .26	29.5 0.9
Oct. 5.6	60.42 .30	29.9 2.0	26.16 .20	11.7 0.7	37.67 .31	36.1 1.8	33.03 .24	30.4 0.8
15.6	60.70 .26	32.0 2.1	26.35 .17	12.5 1.0	37.96 .28	38.0 1.9	33.26 .21	31.1 0.7
25.5	60.94 .22	34.1 2.1	26.51 .15	13.6 1.2	38.22 .24	39.8 1.9	33.46 .19	31.8 0.6
Nov. 4.5	61.14 .17	36.2 2.1	26.64 .11	15.0 1.4	38.44 .19	41.7 1.9	33.63 .16	32.4 0.5
14.5	61.29 .12	38.2 2.0	26.74 .08	16.5 1.5	38.61 .15	43.6 1.8	33.77 .12	32.8 0.4
24.5	61.38 .07	40.2 1.9	26.80 .05	18.1 1.6	38.73 .10	45.4 1.8	33.88 .00	33.2 0.4
Dec. 4.4	61.43 +.02	42.1 1.8	26.84 +.02	19.7 1.6	38.81 +.05	47 2 1.7	33.95 .05	33.5 0.3
14.4	61.42 −.04	43.7 1 5	26.83 −.02	21.3 1.6	38.83 .00	48.8 1.5	33.98 +.01	33.8 0.2
24.4	61.36 .09	45.2 1.3	26.80 .05	22.8 1.4	38.79 −.06	50.1 1.3	33.97 −.03	33.9 +0.1
34.4	61.24 −.14	46.3 +1.0	26.73 −.08	24.2 −1.3	38.71 −.11	51.3 +1.0	33.93 −.06	33.9 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Persei.		γ Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 46	° ′ +31 31	h m 3 52	° ′ −13 50	h m 4 13	° ′ +15 20	h m 4 21	° ′ +18 55
	s	″	s	″	s	″	s	″
(Dec. 30.4)	45.48 −.05	60.8 +0.5	33.42 −.05	47.1 −1.6	7.03 −.02	30.4 −0.4	45.99 −.01	4.0 −0.2
Jan. 9.3	45.41 .09	61.2 0.3	33.35 .09	48.6 1.4	6.99 .06	30.1 0.4	45.96 .05	3.8 0.2
19.3	45.30 .13	61.3 +0.1	33.24 .12	49.9 1.2	6.92 .10	29.7 0.4	45.89 .09	3.6 0.2
29.3	45.16 .16	61.3 −0.1	33.11 .15	50.9 0.9	6.80 .13	29.3 0.4	45.78 .13	3.4 0.3
Feb. 8.3	44.99 .18	61.2 0.3	32.95 .17	51.7 0.6	6.66 .15	28.9 0.4	45.64 .15	3.1 0.3
18.2	44.80 .19	60.8 0.5	32.78 .18	52.2 −0.3	6.50 .17	28.5 0.4	45.47 .17	2.7 0.3
28.2	44.61 .19	60.2 0.6	32.59 .18	52.3 0.0	6.33 .17	28.2 0.4	45.30 .18	2.4 0.4
Mar. 10.2	44.41 .18	59.5 0.8	32.42 .17	52.2 +0.3	6.15 .17	27.8 0.4	45.11 .18	2.0 0.4
20.2	44.24 .16	58.7 0.9	32.25 .16	51.8 0.6	5.98 .16	27.4 0.3	44.94 .17	1.6 0.4
30.1	44.09 .13	57.7 0.9	32.10 .13	51.1 0.9	5.84 .13	27.1 0.3	44.78 .14	1.2 0.4
Apr. 9.1	43.98 .09	56.8 1.0	31.99 .10	50.1 1.1	5.72 .10	26.9 0.2	44.66 .11	0.8 0.3
19.1	43.91 −.04	55.8 0.9	31.90 .06	48.8 1.4	5.64 .06	26.8 −0.1	44.57 .07	0.5 0.3
29.1	43.89 +.01	54.9 0.9	31.86 −.02	47.3 1.6	5.60 −.02	26.7 0.0	44.52 −.03	0.3 −0.2
May 9.0	43.92 .06	54.1 0.7	31.87 +.03	45.6 1.8	5.60 +.03	26.8 +0.2	44.52 +.02	0.2 0.0
19.0	44.01 .11	53.5 0.6	31.92 .07	43.7 2.0	5.65 .07	27.1 0.3	44.56 .07	0.2 +0.1
29.0	44.15 .16	53.0 0.4	32.01 .12	41.6 2.1	5.75 .12	27.5 0.5	44.66 .12	0.4 0.2
June 7.9	44.34 .21	52.7 −0.2	32.15 .16	39.4 2.2	5.89 .16	28.0 0.6	44.79 .16	0.7 0.4
17.9	44.57 .25	52.6 0.0	32.33 .20	37.2 2.2	6.07 .20	28.7 0.8	44.97 .20	1.2 0.5
27.9	44.84 .28	52.8 +0.2	32.54 .23	35.0 2.2	6.29 .23	29.6 0.9	45.19 .23	1.8 0.6
July 7.9	45.14 .31	53.1 0.4	32.78 .25	32.8 2.1	6.54 .26	30.5 1.0	45.44 .26	2.5 0.7
17.8	45.46 .33	53.6 0.6	33.05 .27	30.8 1.9	6.81 .28	31.5 1.0	45.71 .28	3.3 0.8
27.8	45.79 .34	54.4 0.8	33.33 .28	28.9 1.7	7.10 .29	32.5 1.0	46.00 .30	4.2 0.9
Aug. 6.8	46.14 .34	55.2 0.9	33.62 .29	27.3 1.4	7.40 .30	33.5 1.0	46.30 .30	5.0 0.9
16.8	46.48 .34	56.2 1.0	33.91 .29	26.1 1.1	7.70 .30	34.5 1.0	46.61 .31	5.9 0.9
26.7	46.82 .33	57.2 1.1	34.20 .29	25.1 0.7	8.01 .30	35.4 0.9	46.92 .31	6.8 0.8
Sept. 5.7	47.15 .32	58.3 1.1	34.48 .28	24.6 +0.3	8.30 .29	36.2 0.7	47.22 .30	7.5 0.7
15.7	47.46 .30	59.4 1.1	34.75 .26	24.4 −0.1	8.59 .28	36.9 0.6	47.52 .29	8.2 0.6
25.6	47.76 .28	60.6 1.1	35.00 .24	24.7 0.4	8.87 .27	37.4 0.4	47.81 .28	8.8 0.5
Oct. 5.6	48.03 .26	61.7 1.1	35.24 .22	25.3 0.8	9.13 .25	37.8 0.3	48.08 .26	9.2 0.4
15.6	48.28 .24	62.8 1.1	35.45 .20	26.4 1.2	9.37 .23	38.1 +0.2	48.33 .24	9.6 0.3
25.6	48.51 .21	63.8 1.0	35.63 .17	27.7 1.4	9.59 .21	38.1 0.0	48.56 .22	9.8 0.2
Nov. 4.5	48.70 .18	64.8 1.0	35.79 .14	29.2 1.7	9.78 .18	38.1 −0.1	48.76 .19	9.9 +0.1
14.5	48.86 .14	65.7 0.9	35.91 .11	31.0 1.8	9.95 .15	37.9 0.2	48.94 .16	9.9 0.0
24.5	48.98 .10	66.6 0.8	36.00 .07	32.9 1.9	10.08 .12	37.7 0.3	49.09 .13	9.9 −0.1
Dec. 4.5	49.06 .06	67.3 0.7	36.06 +.04	34.9 1.9	10.18 .08	37.4 0.3	49.20 .09	9.8 0.1
14.4	49.10 +.02	68.0 0.6	36.08 .00	36.7 1.8	10.24 .04	37.1 0.3	49.27 .05	9.6 0.1
24.4	49.10 −.03	68.6 0.5	36.06 −.04	38.5 1.7	10.26 +.01	36.7 0.4	49.30 +.01	9.5 0.2
34.4	49.05 −.07	69.0 +0.3	36.01 −.07	40.1 −1.5	10.24 −.03	36.4 −0.4	49.29 −.03	9.3 −0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Tauri. (*Aldebaran*)		α Camelopardalis.		ι Aurigæ.		11 Orionis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 4 29	+16° 16′	h m 4 42	+66° 8′	h m 4 49	+32° 58′	h m 4 57	+15° 14′
	s	″	s	″	s	″	s	″
(Dec. 30.4)	11.38 −.01	15.3 −0.3	24.53 −.07	30.3 +2.3	21.39 +.01	41.8 +0.6	52.01 +.02	16.9 −0.4
Jan. 9.4	11.35 .05	14.9 0.3	24.42 .17	32.4 2.0	21.38 −.04	42.4 0.5	52.01 −.03	16.6 0.4
19.4	11.28 .09	14.6 0.3	24.20 .26	34.3 1.7	21.32 .09	42.9 0.4	51.96 .07	16.2 0.4
29.3	11.18 .12	14.3 0.3	23.90 .34	35.9 1.3	21.21 .13	43.3 0.3	51.87 .10	15.8 0.3
Feb. 8.3	11.04 .15	13.9 0.3	23.53 .40	37.0 0.9	21.06 .16	43.5 +0.1	51.75 .14	15.5 0.3
18.3	10.88 .17	13.6 0.3	23.10 .44	37.6 +0.4	20.88 .19	43.5 0.0	51.60 .16	15.2 0.3
28.2	10.71 .18	13.2 0.3	22.64 .47	37.8 −0.1	20.68 .20	43.4 −0.2	51.43 .18	15.0 0.3
Mar. 10.2	10.53 .18	12.9 0.3	22.16 .46	37.4 0.6	20.47 .21	43.1 0.4	51.25 .18	14.7 0.3
20.2	10.36 .17	12.5 0.3	21.71 .44	36.6 1.0	20.27 .20	42.6 0.5	51.06 .17	14.4 0.2
30.2	10.20 .14	12.2 0.3	21.29 .39	35.4 1.4	20.08 .18	42.0 0.7	50.90 .16	14.2 0.2
Apr. 9.1	10.07 .11	12.0 0.2	20.93 .32	33.8 1.8	19.92 .14	41.2 0.8	50.75 .13	14.1 0.1
19.1	9.97 .08	11.8 −0.1	20.64 .24	31.8 2.1	19.79 .10	40.4 0.8	50.64 .10	14.0 −0.1
29.1	9.92 −.03	11.7 0.0	20.44 .15	29.6 2.3	19.71 .06	39.6 0.8	50.56 .06	14.0 0.0
May 9.1	9.91 +.01	11.8 +0.1	20.34 −.05	27.3 2.4	19.68 −.01	38.7 0.8	50.52 −.01	14.0 +0.1
19.0	9.94 .06	11.9 0.2	20.34 +.05	24.9 2.4	19.70 +.05	37.9 0.8	50.53 +.03	14.2 0.2
29.0	10.03 .11	12.2 0.4	20.45 .16	22.5 2.3	19.77 .10	37.2 0.7	50.59 .08	14.5 0.4
June 8.0	10.16 .15	12.7 0.5	20.66 .26	20.2 2.2	19.90 .15	36.6 0.5	50.69 .12	14.9 0.5
17.9	10.32 .19	13.2 0.6	20.96 .35	18.0 2.0	20.07 .19	36.2 0.4	50.83 .16	15.4 0.6
27.9	10.53 .22	14.0 0.8	21.35 .43	16.1 1.8	20.28 .23	35.8 0.2	51.01 .20	16.1 0.7
July 7.9	10.77 .25	14.8 0.8	21.82 .50	14.4 1.5	20.54 .27	35.7 −0.1	51.22 .23	16.8 0.7
17.9	11.03 .27	15.6 0.9	22.35 .56	13.0 1.2	20.82 .30	35.7 +0.1	51.46 .25	17.6 0.8
27.8	11.32 .29	16.5 0.9	22.93 .60	12.0 0.9	21 13 .32	35.8 0.2	51.73 .27	18.4 0.8
Aug. 6.8	11.61 .30	17.4 0.9	23.55 .64	11.3 0.5	21.45 .33	36.0 0.3	52.01 .29	19.2 0.8
16.8	11.91 .30	18.3 0.9	24.20 .66	10.9 −0.2	21.79 .34	36.4 0.4	52.30 .30	19.9 0.7
26.8	12.22 .30	19.1 0.8	24.87 .67	11.0 +0.2	22.13 .34	36.9 0.5	52.60 .30	20.6 0.6
Sept. 5.7	12.52 .30	19.9 0.7	25.54 .67	11.3 0.5	22.48 .34	37.4 0.6	52.90 .30	21.1 0.5
15.7	12.81 .29	20.5 0.5	26.21 .06	12.0 0.9	22.82 .34	38.0 0.6	53.20 .29	21.6 0.4
25.7	13.10 .28	20.9 0.4	26.86 .63	13.1 1.2	23.15 .33	38.6 0.6	53.49 .29	21.8 0.2
Oct. 5.6	13.36 .26	21.2 0.3	27.48 .60	14.5 1.5	23.47 .31	39.2 0.6	53.77 .28	22.0 +0.1
15.6	13.62 .24	21.4 +0.1	28.06 .56	16.1 1.8	23.78 .29	39.8 0.6	54.04 .26	22.0 −0.1
25 6	13.85 .22	21.5 0.0	28.60 .51	18.0 2.0	24.06 .27	40.5 0.7	54.29 .24	21.8 0.2
Nov. 4.6	14.06 .20	21.4 −0.1	29.08 .44	20.2 2.2	24.32 .25	41.2 0.7	54.52 .22	21.6 0.3
14.5	14.24 .17	21.2 0.2	29.49 .37	22.5 2.4	24.55 .21	41.8 0.7	54.73 .19	21.2 0.4
24.5	14.39 .13	21.0 0.3	29.82 .29	25.0 2.5	24.74 .18	42.5 0.7	54.90 .16	20.8 0.4
Dec. 4.5	14.51 .10	20.7 0.3	30.06 .19	27.5 2.6	24.90 .13	43.2 0.7	55.05 .13	20.4 0.4
14.5	14.59 .06	20.4 0.3	30.21 +.10	30.1 2.5	25.01 .09	43.9 0.7	55.16 .08	20.0 0.4
24.4	14.62 +.02	20.1 0.3	30.26 −.01	32.5 2.4	25.07 +.04	44.6 0.6	55.22 +.04	19.5 0.4
34.4	14.62 −.03	19.8 −0.3	30.20 −.11	34.8 +2.2	25.09 −.01	45.2 +0.6	55.24 .00	19.1 −0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Aurigæ. (*Capella.*)		*β* Orionis. (*Rigel.*)		*β* Tauri.		Groombridge 966.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 7	+45° 52′	h m 5 8	−8° 20′	h m 5 18	+28° 30′	h m 5 23	+74° 57′
	s	″	s	″	s	″	s	″
(Dec. 30.4)	61.72 +.03	36.3 +1.3	54.24 +.01	25.8 −1.7	52.71 +.04	21.6 +0.4	65.32 −.01	47.6 +2.8
Jan. 9.4	61.71 −.03	37.6 1.2	54.23 −.03	27.4 1.5	52.73 −.01	22.0 0.3	65.23 .17	50.3 2.6
19.4	61.65 .10	38.8 1.1	54.18 .07	28.8 1.4	52.70 .06	22.3 0.3	64.98 .33	52.7 2.3
29.4	61.52 .15	39.7 0.9	54.09 .11	30.1 1.1	52.62 .10	22.6 0.2	64.58 .47	54.9 2.0
Feb. 8.3	61.35 .19	40.5 0.6	53.96 .14	31.1 0.9	52.49 .14	22.8 +0.1	64.04 .59	56.6 1.5
18.3	61.14 .23	40.9 +0.3	53.81 .16	31.9 0.7	52.34 .17	22.8 0.0	63.40 .68	58.0 1.1
28.3	60.90 .25	41.1 0.0	53.64 .18	32.4 0.4	52.15 .19	22.8 −0.1	62.68 .74	58.8 +0.5
Mar. 10.2	60.64 .26	41.0 −0.3	53.45 .19	32.7 −0.1	51.95 .20	22.7 0.2	61.92 .76	59.0 0.0
20.2	60.38 .25	40.5 0.6	53.26 .18	32.7 +0.1	51.75 .19	22.4 0.3	61.16 .75	58.7 −0.6
30.2	60.14 .23	39.8 0.8	53.09 .17	32.4 0.4	51.56 .18	22.0 0.4	60.43 .70	57.9 1.1
Apr. 9.2	59.93 .19	38.8 1.1	52.93 .14	31.9 0.6	51.39 .16	21.6 0.5	59.76 .62	56.6 1.5
19.1	59.75 .15	37.7 1.2	52.80 .11	31.2 0.9	51.25 .12	21.0 0.6	59.18 .52	54.8 1.9
29.1	59.63 .10	36.3 1.4	52.70 .08	30.2 1.1	51.15 .08	20.5 0.6	58.72 .39	52.7 2.3
May 9.1	59.56 −.04	34.9 1.4	52.65 −.04	29.0 1.3	51.09 −.03	19.9 0.6	58.40 .25	50.3 2.5
19.1	59.56 +.02	33.4 1.5	52.63 +.01	27.6 1.5	51.08 +.02	19.4 0.5	58.22 −.10	47.7 2.7
29.0	59.61 .09	32.0 1.4	52.66 .05	26.0 1.6	51.13 .06	18.9 0.5	58.19 +.06	45.0 2.7
June 8.0	59.73 .15	30.6 1.3	52.73 .09	24.3 1.8	51.21 .11	18.4 0.4	58.32 .21	42.3 2.7
18.0	59.90 .20	29.3 1.2	52.84 .13	22.5 1.8	51.35 .16	18.1 0.3	58.61 .35	39.6 2.6
27.9	60.13 .25	28.2 1.1	53.00 .17	20.7 1.9	51.53 .20	17.9 0.2	59.03 .49	37.0 2.4
July 7.9	60.40 .29	27.2 0.9	53.18 .20	18.8 1.8	51.75 .23	17.8 −0.1	59.59 .62	34.7 2.2
17.9	60.72 .33	26.4 0.7	53.39 .23	17.0 1.7	52.00 .26	17.8 0.0	60.26 .72	32.6 2.0
27.9	61.06 .36	25.9 0.5	53.63 .25	15.3 1.6	52.27 .28	17.9 +0.1	61.04 .82	30.8 1.7
Aug. 6.8	61.44 .38	25.5 0.3	53.89 .26	13.8 1.4	52.56 .30	18.1 0.2	61.90 .89	29.2 1.3
16.8	61.82 .40	25.3 −0.1	54.16 .27	12.5 1.1	52.88 .32	18.3 0.2	62.82 .95	28.1 0.9
26.8	62.23 .40	25.3 +0.1	54.44 .28	11.5 0.8	53.20 .32	18.6 0.3	63.80 1.00	27.4 0.6
Sept. 5.8	62.63 .41	25.5 0.3	54.72 .28	10.9 0.5	53.52 .33	18.9 0.3	64.82 1.02	27.0 −0.2
15.7	63.04 .40	25.8 0.5	55.00 .28	10.5 +0.2	53.85 .33	19.2 0.3	65.84 1.02	27.1 +0.2
25.7	63.44 .40	26.4 0.6	55.28 .27	10.6 −0.2	54.18 .32	19.4 0.3	66.86 1.01	27.5 0.6
Oct. 5.7	63.84 .38	27.1 0.8	55.55 .26	11.0 0.6	54.50 .31	19.7 0.3	67.87 .98	28.3 1.0
15.6	64.21 .37	27.9 0.9	55.81 .25	11.8 0.9	54.80 .30	20.0 0.3	68.83 .94	29.6 1.4
25.6	64.57 .34	28.9 1.0	56.05 .23	12.8 1.2	55.10 .28	20.2 0.3	69.74 .87	31.1 1.8
Nov. 4.6	64.89 .31	30.0 1.2	56.27 .21	14.2 1.5	55.37 .26	20.5 0.3	70.57 .78	33.1 2.1
14.6	65.18 .27	31.2 1.3	56.47 .18	15.8 1.7	55.62 .23	20.7 0.3	71.30 .68	35.3 2.4
24.5	65.44 .23	32.5 1.3	56.64 .15	17.6 1.8	55.84 .20	21.0 0.3	71.92 .55	37.8 2.6
Dec. 4.5	65.64 .18	33.8 1.4	56.77 .12	19.4 1.9	56.02 .16	21.3 0.3	72.40 .41	40.5 2.7
14.5	65.79 .12	35.3 1.4	56.87 .08	21.3 1.8	56.16 .12	21.6 0.3	72.74 .26	43.3 2.8
24.5	65.89 +.06	36.7 1.4	56.93 +.04	23.1 1.8	56.25 .07	22.0 0.3	72.92 +.09	46.1 2.8
34.4	65.92 .00	38.0 +1.3	56.94 −.01	24.8 −1.7	56.30 +.03	22.3 +0.4	72.92 −.07	48.9 +2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.		α Leporis.		ε Orionis.		α Columbæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	$5^{h}\ 25^{m}$	$-0^{\circ}\ 23'$	$5^{h}\ 27^{m}$	$-17^{\circ}\ 54'$	$5^{h}\ 30^{m}$	$-1^{\circ}\ 16'$	$5^{h}\ 35^{m}$	$-34^{\circ}\ 8'$
	s	″	s	″	s	″	s	″
(Dec. 30.4)	61.00 +.03	20.3 −1.3	33.78 +.02	34.3 −2.1	15.86 +.04	47.3 −1.4	24.91 .00	23.8 −2.9
Jan. 9.4	61.02 −.01	21.6 1.2	33.78 −.03	36.5 2.0	15.87 −.01	48.6 1.3	24.88 −.05	26.6 2.7
19.4	60.98 .05	22.8 1.1	33.73 .07	38.4 1.8	15.84 .05	49.8 1.1	24.81 .10	29.1 2.4
29.4	60.91 .09	23.8 0.9	33.64 .11	40.1 1.5	15.77 .09	50.9 1.0	24.68 .15	31.3 2.0
Feb. 8.3	60.80 .13	24.6 0.7	33.50 .15	41.5 1.2	15.66 .12	51.8 0.8	24.51 .18	33.1 1.6
18.3	60.66 .15	25.2 0.6	33.34 .17	42.5 0.9	15.52 .15	52.5 0.6	24.31 .21	34.5 1.2
28.3	60.50 .17	25.7 0.4	33.16 .19	43.2 0.5	15.36 .17	52.9 0.4	24.09 .24	35.5 0.7
Mar. 10.3	60.32 .18	26.0 −0.2	32.96 .20	43.6 −0.2	15.18 .18	53.2 −0.2	23.84 .24	36.0 −0.2
20.2	60.14 .18	26.1 0.0	32.76 .20	43.6 +0.1	15.00 .18	53.4 0.0	23.60 .24	36.0 +0 2
30.2	59.96 .17	26.0 +0.2	32.57 .19	43.3 0.5	14.82 .17	53.3 +0.2	23.36 .23	35.6 0.6
Apr. 9.2	59.80 .15	25.8 0.3	32.39 .17	42.7 0.8	14.66 .15	53.0 0.4	23.13 .21	34.8 1.0
19.1	59.67 .12	25.3 0.5	32.24 .14	41.8 1.1	14 53 .12	52.6 0.5	22.93 .18	33.5 1.4
29.1	59.57 .08	24.7 0.7	32.12 .10	40.5 1.4	14.42 .09	51.9 0 7	22.77 .14	31.9 1.8
May 9.1	59.50 −.04	23.9 0.9	32.03 .06	39.0 1.6	14.36 .05	51.1 0.9	22.64 .10	30.0 2.1
19.1	59.48 .00	23.0 1.0	31.99 −.02	37.3 1.8	14.33 −.01	50.1 1.1	22.56 .06	27.7 2.4
29.0	59.50 +.04	21.9 1.2	31.99 +.02	35.4 2.0	14.34 +.04	49.0 1.2	22.53 −.01	25.2 2.6
June 8.0	59.56 .08	20.6 1.3	32.04 .07	33.2 2.2	14.40 .08	47.7 1.3	22.54 +.04	22.5 2.7
18.0	59.67 .12	19.3 1.4	32.12 .11	31.0 2.2	14.50 .12	46.8 1.4	22.61 .09	19.7 2.8
28.0	59.81 .16	17.9 1.4	32.25 .15	28.8 2.3	14.64 .15	44.9 1.5	22.72 .13	16.8 2.8
July 7.9	59.98 .19	16.4 1.4	32.42 .18	26.5 2.2	14.81 .19	43.4 1.5	22.87 .17	14.0 2.8
17.9	60.19 .22	15.0 1.4	32.61 .21	24.4 2.1	15.01 .21	42.0 1.4	23.06 .21	11.3 2.6
27.9	60.42 .24	13.7 1.3	32.83 .24	22.4 1.9	15.24 .24	40.6 1.3	23.28 .24	8.8 2.4
Aug. 6.8	60.67 .26	12.4 1.2	33.08 .26	20.6 1.7	15.48 .25	39.3 1.2	23.54 .27	6.6 2.0
16.8	60.93 .27	11.4 1.0	33.34 .27	19.0 1.4	15.74 .27	38.2 1.0	23.82 .29	4.7 1.6
26.8	61.21 .28	10.5 0.7	33.62 .28	17.9 1.0	16.02 .28	37.4 0.7	24.11 .30	3.3 1.2
Sept. 5.8	61.49 .28	9.9 0.5	33.90 .29	17.1 0.6	16.30 .28	36.8 0.5	24.42 .31	2.4 0.7
15.7	61.77 .28	9.6 +0.2	34.19 .29	16.7 +0.1	16.58 .28	36.4 +0.2	24.74 .32	2.0 +0.1
25.7	62.05 .28	9.6 −0.1	34.48 .28	16.8 −0.3	16.86 .28	36.4 −0.1	25.05 .31	2.1 −0.4
Oct. 5.7	62.33 .27	9.8 0.4	34.76 .28	17.4 0.8	17.14 .27	36.7 0.4	25.36 .30	2.8 1.0
15.7	62.60 .26	10.4 0.7	35.03 .26	18.4 1.2	17.41 .26	37.3 0.7	25.66 .29	4.1 1.5
25 6	62.85 .25	11.2 0.9	35.29 .25	19.8 1.6	17.66 .25	38.2 1.0	25.94 .27	5.8 2.0
Nov. 4.6	63.09 .23	12.3 1.2	35.52 .22	21.5 1.9	17.90 .23	39.3 1.2	26.20 .24	8.0 2.4
14.6	63.31 .20	13.5 1.3	35.74 .20	23.5 2.1	18.12 .20	40.6 1.4	26.43 .21	10.6 2.7
24.5	63.49 .17	14.9 1.4	35.92 .16	25.8 2.3	18.31 .18	42.0 1.5	26.62 .17	13.4 2.9
Dec. 4.5	63.65 .14	16.4 1.5	36.06 .13	28.1 2.4	18.47 .14	43.6 1.5	26.77 .13	16.5 3.1
14.5	63.77 .10	17.8 1.5	36.17 .09	30.5 2.4	18.60 .10	45.1 1.5	26.88 .08	19.6 3.1
24.5	63.85 .06	19.3 1.4	36.24 +.04	32.9 2.3	18.68 .06	46.6 1.5	26.93 +.03	22 6 3.0
34.4	63.89 +.02	20.6 −1.3	36.26 .00	35.1 −2.2	18.72 +.02	48.0 −1.4	26.93 −.02	25.6 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis.		ν Orionis.		22 Camelop. (H.)		μ Geminorum.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 48	° ′ +7 22	h m 6 0	° ′ +14 46	h m 6 5	° ′ +69 21	h m 6 15	° ′ +22 34
	s	″	s	″	s	″	s	″
(Dec. 30.5)	49.42 +.06	56.8 −1.0	52.63 +.08	47.6 −0.6	56.23 +.14	28.7 +2.5	51.97 +.10	16.5 −0.1
Jan. 9.5	49.46 +.02	55.9 0.9	52.69 +.03	47.0 0.5	56.31 .00	31.2 2.5	52.04 +.05	16.4 0.0
19.4	49.45 −.03	55.1 0.7	52.69 −.02	46.6 0.4	56.24 −.13	33.7 2.4	52.06 .00	16.4 0.0
29.4	49.40 .07	54.4 0.6	52.65 .06	46.3 0.3	56.06 .24	36.0 2.1	52.04 −.05	16.5 +0.1
Feb. 8.4	49.30 .11	53.8 0.5	52 57 .10	46.0 0.2	55.76 .34	37.9 1.8	51.96 .10	16.6 0.1
18.3	49.18 .14	53.4 0.4	52.45 .14	45.8 0.2	55.37 .43	39.6 1.4	51.84 .14	16.7 0.1
28.3	49.02 .16	53.0 0.3	52.29 .16	45.6 0.1	54.90 .50	40.8 1.0	51.69 .16	16.8 +0.1
Mar. 10.3	48.85 .18	52.8 0.2	52.12 .18	45.5 0.1	54.37 .54	41.5 +0.5	51.51 .18	16.9 0.0
20.3	48.66 .18	52.7 −0.1	51.94 .18	45.4 −0.1	53.82 .55	41.7 0.0	51.32 .19	16.9 0.0
30.2	48.49 .17	52.6 0.0	51.76 .18	45.4 0.0	53.28 .53	41.4 −0.5	51.13 .19	16.8 −0.1
Apr. 9.2	48.32 .15	52.7 +0.1	51.59 .16	45.3 0.0	52.75 .50	40.7 1.0	50.95 .17	16.7 0.1
19.2	48.18 .13	52.9 0.2	51.44 .13	45.4 0.0	52.28 .44	39.5 1.4	50.79 .15	16.6 0.2
29.2	48.07 .09	53.2 0.4	51.32 .10	45.5 +0.1	51.88 .35	37.9 1.8	50.66 .11	16.4 0.2
May 9.1	47.99 .06	53.6 0.5	51.23 .06	45.5 0.2	51.57 .26	36.0 2.1	50.56 .08	16.2 0.2
19.1	47 96 −.02	54.2 0.6	51.19 −.02	45.7 0.2	51.36 .16	33.8 2.3	50.50 −.04	16.0 0.2
29.1	47.96 +.03	51.8 0.7	51.19 +.02	45.9 0.3	51.26 −.04	31.4 2.4	50.49 +.01	15.9 0.2
June 8.0	48.01 .07	55.6 0.8	51.23 .06	46.2 0.3	51.27 +.06	28.9 2.5	50.52 .05	15.7 0.1
18.0	48.10 .11	56.4 0.9	51.31 .10	46.6 0.4	51.39 .17	26.3 2.5	50.59 .09	15.6 −0.1
28.0	48.22 .14	57.3 0.9	51.44 .14	47.0 0.5	51.62 .28	23.8 2.5	50.71 .13	15.6 0.0
July 8.0	48.39 .18	58.3 1.0	51.59 .17	47.5 0.5	51.95 .38	21.4 2.4	50.86 .17	15.5 0.0
17.9	48.58 .21	59.2 1.0	51.78 .20	48.1 0.5	52.38 .46	19.1 2.2	51.05 .20	15.6 0.0
27.9	48.80 .23	60.2 0.9	52.00 23	48.6 0.5	52.88 .54	17.0 2.0	51.27 .23	15.6 0.0
Aug. 6.9	49.04 .25	61.0 0.8	52.24 .25	49.1 0.5	53.46 .61	15.2 1.7	51.51 .25	15.6 0.0
16.9	49.30 .27	61.8 0.7	52.50 .27	49.5 0.4	54.10 .67	13.6 1.4	51.77 .27	15.7 0.0
26.8	49.57 .28	62.4 0.5	52.78 .28	49.9 0.3	54.79 .71	12.4 1.1	52.05 .29	15.7 0.0
Sept. 5.8	49.85 .28	62.8 0.3	53.07 .29	50.1 +0.2	55.52 .74	11.4 0.8	52.35 .30	15.7 −0.1
15.8	50.14 .29	63.0 +0.1	53.36 .30	50.2 0.0	56.27 .76	10.9 −0.4	52.65 .31	15.6 0.1
25.7	50.43 .29	63.0 −0.1	53.66 .30	50.1 −0.1	57.04 .77	10.6 0.0	52.96 .31	15.4 0.2
Oct. 5.7	50.71 .28	62.8 0.3	53.95 .30	49.9 0.3	57.81 .76	10.8 +0.3	53.28 .31	15.1 0.3
15.7	50.99 .28	62.4 0.5	54.25 .29	49.6 0.4	58.57 .75	11.3 0.7	53.59 31	14.8 0.3
25.7	51.27 .27	61.7 0.7	54.54 .28	49.1 0.5	59.30 .71	12.2 1.0	53.90 .30	14.4 0.4
Nov. 4.6	51.52 .25	60.9 0.9	54.81 .27	48.5 0.6	60.00 .67	13.4 1.4	54.20 .29	14.0 0.4
14.6	51.76 .23	60.0 1.0	55.07 .25	47.8 0.7	60.64 .60	15.0 1.7	54.48 .27	13.6 0.4
24.6	51.98 .20	58.9 1.1	55.30 .22	47.1 0.7	61.21 .52	16.8 2.0	54.74 .24	13.3 0.4
Dec. 4.6	52.16 .17	57.8 1.1	55.50 .20	46.4 0.7	61.69 .43	19.0 2 2	54.96 .21	12.9 0.3
14.5	52.32 .13	56 8 1.1	55.67 .15	45.8 0.7	62.07 .32	21.3 2.4	55.16 .17	12.6 0.2
24.5	52.42 .08	56.7 1.0	55.80 .10	45.1 0.6	62.34 .20	23.8 2.6	55.31 .13	12.4 0.2
34.5	52.49 +.03	54.8 −0.9	55.88 +.05	44.6 −0.5	62.48 +.08	26.4 +2.7	55.41 +.09	12.4 −0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Argus. (*Canopus.*)		*γ* Geminorum.		*α* Canis Majoris. (*Sirius.*)		*ε* Canis Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 6 21	° ′ -52 37	h m 6 30	° ′ +16 29	h m 6 39	° ′ -16 33	h m 6 53	° ′ -28 48
	s	″	s	″	s	″	s	″
(Dec. 30.5)	22.75 +.01	60.2 −3.6	56.25 +.11	49.0 −0.5	59.17 +.09	26.9 −2.5	61.68 +.10	50.8 −3.0
Jan. 9.5	22.73 −.06	63.7 3.4	56.33 .06	48.5 0.4	59.24 +.04	29.3 2.3	61.75 +.04	53.7 2.9
19.4	22.63 .13	67.0 3.1	56.36 +.01	48.1 0.3	59.25 −.01	31.5 2.1	61.77 −.01	56.6 2.7
29.4	22.47 .19	70.0 2.8	56.35 −.04	47.8 0.2	59.22 .06	33.6 1.9	61.73 .06	59.1 2.4
Feb. 8.4	22.25 .25	72.6 2.4	56.29 .08	47.7 0.1	59.14 .10	35.3 1.6	61.64 .11	61.4 2.1
18.4	21.98 −.29	74.7 −1.9	56.18 −.12	47.6 −0.1	59.02 −.14	36.8 −1.3	61.51 −.15	63.3 −1.7
28.3	21.66 .33	76.3 1.4	56.04 .15	47.5 0.0	58.87 .16	37.9 1.0	61.34 .18	64.9 1.4
Mar. 10.3	21.32 .35	77.5 0.9	55.88 .17	47.5 0.0	58.70 .18	38.8 0.7	61.15 .20	66.0 1.0
20.3	20.96 .36	78.1 −0.4	55.70 .18	47.5 0.0	58.50 .20	39.3 −0.3	60.93 .22	66.8 0.5
30.3	20.60 .36	78.2 +0.2	55.52 .18	47.5 0.0	58.31 .20	39.4 0.0	60.71 .22	67.1 −0.1
Apr. 9.2	20.25 −.34	77.8 +0.7	55.34 −.17	47.6 0.0	58.12 −.18	39.2 +0.3	60.49 −.21	67.0 +0.3
19.2	19.92 .31	76.8 1.2	55.18 .15	47.6 0.0	57.94 .17	38.8 0.6	60.28 .20	66.6 0.7
29.2	19.62 .28	75.4 1.6	55.04 .12	47.6 +0.1	57.78 .14	38.1 0.9	60.10 .17	65.7 1.0
May 9.1	19.36 .23	73.6 2.0	54.94 .08	47.7 0.1	57.65 .11	37.0 1.2	59.94 .14	64.5 1.4
19.1	19.15 .18	71.4 2.4	54.87 .05	47.8 0.1	57.56 .08	35.7 1.4	59.81 .11	62.9 1.7
29.1	19.00 −.12	68.8 +2.7	54.84 −.01	47.9 +0.2	57.51 −.03	34.2 +1.6	59.72 −.07	61.1 +2.0
June 8.1	18.91 −.06	66.0 2.9	54.86 +.04	48.1 0.2	57.49 .00	32.5 1.8	59.67 −.03	59.0 2.2
18.0	18.87 .00	62.9 3.1	54.92 .08	48.3 0.2	57.51 +.04	30.6 1.9	59.66 +.01	56.7 2.4
28.0	18.90 +.06	59.8 3.2	55.01 .11	48.6 0.3	57.57 .08	28.7 2.0	59.70 .05	54.2 2.5
July 8.0	18.98 .12	56.6 3.2	55.14 .15	48.9 0.3	57.66 .11	26.7 2.0	59.77 .09	51.8 2.5
18.0	19.13 +.17	53.4 +3.1	55.31 +.18	49.2 +0.3	57.80 +.15	24.7 +1.9	59.88 +.13	49.2 +2.5
27.9	19.33 .22	50.5 2.9	55.50 .21	49.5 0.3	57.96 .18	22.8 1.8	60.03 .16	46.8 2.3
Aug. 6.9	19.58 .27	47.7 2.6	55.73 .23	49.8 0.2	58.15 .20	21.0 1.6	60.21 .20	44.6 2.1
16.9	19.88 .32	45.3 2.2	55.97 .25	50.0 0.2	58.37 23	19.5 1.4	60.43 .23	42.6 1.8
26.8	20.21 .35	43.4 1.7	56.23 .27	50.1 +0.1	58.61 .25	18.3 1.1	60.66 .26	40.9 1.5
Sept. 5.8	20.57 +.38	41.9 +1.2	56.51 +.28	50.1 0.0	58.86 +.26	17.4 +0.7	60.93 +.27	39.6 +1.1
15.8	20.96 .40	41.0 +0.6	56.80 .29	50.0 −0.2	59.14 .28	16.8 +0.3	61.21 .29	38.8 0.6
25.8	21.36 .40	40.8 −0.1	57.09 .30	49.8 0.3	59.42 .28	16.8 −0.1	61.50 .30	38.4 +0.1
Oct. 5.7	21.77 .40	41.1 0.7	57.40 .30	49.4 0.4	59.71 .29	17.1 0.6	61.81 .31	38.6 −0.5
15.7	22.17 .39	42.2 1.4	57.70 .30	48.9 0.5	60.00 .29	17.9 1.0	62.12 .31	39.4 1.0
25.7	22.56 +.37	43.8 −2.0	58.00 +.30	48.4 −0.6	60.28 +.28	19.2 −1.4	62.43 +.30	40.6 −1.5
Nov. 4.7	22.92 .34	46.0 2.4	58.29 .29	47.6 0.7	60.57 .27	20.8 1.8	62.73 .29	42.4 2.0
14.6	23.24 .30	48.7 2.9	58.57 .27	46.9 0.8	60.83 .25	22.7 2.1	63.02 .27	44.5 2.4
24.6	23.52 .26	51.8 3.2	58.83 .25	46.1 0.7	61.08 .23	24.9 2.3	63.28 .25	47.1 2.7
Dec. 4.6	23.75 +.18	55.2 −3.5	59.06 +.22	45.4 −0.7	61.29 +.20	27.4 −2.5	63.51 +.21	49.9 −2.9
14.5	23.91 .12	58.7 3.6	59.26 .18	44.7 0.7	61.47 .16	29.9 2.5	63.70 .17	52.8 3.0
24.5	24.00 +.06	62.4 3.6	59.42 .14	44.1 0.6	61.61 .12	32.4 2.5	63.85 .12	55.9 3.0
34.5	24.02 −.01	66.0 −3.5	59.53 +.09	43.5 −0.5	61.70 +.07	34.9 −2.4	63.95 +.08	58.9 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Canis Majoris.		δ Geminorum.		Piazzi vii. 67.		α²Geminorum. (*Castor*.)	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	7 3	−26 12	7 13	+22 11	7 18	+68 41	7 27	+32 8
	s	″	s	″	s	″	s	″
(Dec. 30.5)	37.95 +.11	29.9 −3.0	7.11 +.16	45.2 −0.3	41.09 +.31	65.8 +2.3	6.98 +.17	35.7 +0.2
Jan. 9.5	38.03 +.06	32.8 2.8	7.24 .11	45.0 −0.2	41.34 .19	68.2 2.4	7.14 .12	36.0 0.4
19.5	38.06 .00	35.6 2.6	7.32 +.05	44.9 0.0	41.47 +.06	70.7 2.5	7 24 .07	36.5 0.6
29.4	38.04 −.05	38.1 2.4	7.34 .00	44.9 +0.1	41.47 −.06	73.2 2.5	7.29 +.01	37.2 0.7
Feb. 8.4	37.97 .10	40.3 2.1	7.32 −.05	45 1 0.2	41.35 .18	75.6 2.3	7.27 −.04	37.9 0.7
18.4	37.85 −.14	42.2 −1.7	7.24 −.10	45.3 +0.2	41.10 −.29	77.8 +2.1	7.20 −.09	38.6 +0.7
28.4	37.70 .17	43.8 1.4	7.13 .13	45.6 0.3	40.76 .38	79.8 1.8	7.08 .14	39.3 0.7
Mar. 10.3	37.51 .19	44.9 1.0	6.98 .16	45.8 0.3	40.34 .46	81.3 1.3	6.93 .17	40.0 0.6
20.3	37.31 .21	45.7 0.6	6.80 .18	46.1 0.2	39.85 .50	82.4 0.9	6.74 .19	40.5 0.5
30.3	37.10 .21	46.1 −0.2	6.62 .19	46.3 0.2	39.33 .52	83.1 +0.4	6.55 .20	41.0 0.4
Apr. 9.3	36.88 −.21	46.1 +0.2	6.43 −.18	46.4 +0.1	38.80 −.52	83.3 −0.1	6.34 −.20	41.2 +0.2
19.2	36.68 .19	45.7 0.6	6.26 .17	46.6 +0.1	38.29 .49	83.0 0.6	6.15 .19	41.3 0.0
29.2	36.50 .17	45.0 0.9	6.10 .14	46.6 0.0	37.81 .45	82.2 1.0	5.97 .16	41.3 −0.1
May 9.2	36.34 .14	43.8 1.3	5.97 .11	46.6 0.0	37.38 .38	80.9 1.4	5.82 .14	41.0 0.3
19.1	36.22 .11	42.4 1.6	5.87 .08	46.5 −0.1	37.05 .30	79.3 1.8	5.70 .10	40.7 0.4
29.1	36.13 −.07	40.7 +1.8	5.81 −.04	46.4 −0.1	36.79 −.21	77.4 −2.1	5.62 −.06	40.2 −0.5
June 8.1	36.08 −.04	38.7 2.1	5.79 .00	46.3 0.1	36.63 .11	75.1 2.3	5.58 −.02	39.6 0.6
18.1	36.06 +.01	36.6 2.2	5.81 +.04	46.2 0.1	36.57 −.01	72.7 2.5	5.58 +.02	38.9 0.7
28.0	36.09 .05	34.3 2.3	5.87 .08	46.0 0.2	36.60 +.09	70.2 2.6	5.63 .07	38.2 0.7
July 8.0	36.16 .09	31.9 2.4	5.96 .11	45.8 0.2	36.74 .18	67.5 2.6	5.71 .11	37.4 0.8
18.0	36.26 +.12	29.5 +2.4	6.10 +.15	45.7 −0.2	36.97 +.28	64.9 −2.6	5.84 +.14	36.6 −0.8
28.0	36.40 .16	27.2 2.2	6.26 .18	45.5 0.2	37.30 .36	62.3 2.5	6.00 .18	35.8 0.8
Aug. 6.9	36.57 .19	25.0 2.1	6.45 .21	45.3 0.2	37.70 .44	59.8 2.4	6.19 .21	35.0 0.8
16.9	36.78 .22	23.1 1.8	6.67 .23	45.0 0.3	38.18 .52	57.5 2.2	6.42 .24	34.1 0.9
26.9	37.00 .24	21.5 1.4	6.91 .25	44.7 0.4	38.73 .58	55.4 2.0	6.67 .26	33.3 0.9
Sept. 5.8	37.26 +.26	20.2 +1.0	7.18 +.27	44.2 −0.4	39.34 +.63	53.5 −1.8	6.94 +.29	32.4 −0.9
15.8	37.53 .28	19.4 0.6	7.46 .29	43.8 0.5	39.99 .68	51.8 1.5	7.24 .31	31.5 0.9
25.8	37.82 .29	19.0 +0.1	7.75 .30	43.2 0.6	40.70 .71	50.5 1.2	7.55 .32	30.6 0.9
Oct. 5 8	38.12 .30	19.2 −0.4	8.06 .31	42.5 0.7	41.42 .74	49.5 0.8	7.88 .34	29.8 0.9
15.7	38.42 .31	19.9 0.9	8.38 .32	41.8 0.8	42.17 .75	48.9 −0.4	8.23 .34	28.9 0.8
25.7	38.73 +.30	21.1 −1.4	8.70 +.32	41.0 −0.8	42.92 +.75	48.6 0.0	8.58 +.35	28.1 −0.8
Nov. 4.7	39.03 .29	22.7 1.9	9.02 .31	40.2 0.8	43.66 .73	48.8 +0.4	8.92 .35	27.4 0.6
14.7	39.32 .28	24.8 2.3	9.33 .30	39.4 0.8	44.38 .70	49.4 0.8	9.27 .34	26.8 0.5
24.6	39.59 .25	27 3 2.6	9.62 .29	38.7 0.7	45.06 .64	50.4 1.2	9.60 .32	26.3 0.4
Dec. 4.6	39.82 +.22	30.0 −2.8	9.90 +.26	38.0 −0.6	45.67 +.57	51.7 +1.6	9.91 +.29	26.0 −0.2
14.6	40.03 .18	32.8 2.9	10.14 .22	37.4 0.5	46.20 .49	53.5 1.9	10.19 .26	25.9 0.0
24.5	40.19 .14	35.8 2.9	10.35 .18	37.0 0.4	46.64 .38	55.5 2.2	10.42 .21	26.0 +0.2
34.5	40.30 +.09	38.7 −2.9	10.51 +.14	36.6 −0.2	46.96 +.27	57.8 +2.4	10.61 +.16	26.2 +0.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Canis Minoris. (*Procyon.*)		*β* Geminorum. (*Pollux.*)		*φ* Geminorum.		3 Ursæ Majoris (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 33	° ′ +5 31	h m 7 38	° ′ +28 18	h m 7 46	° ′ +27 3	h m 8 1	° ′ +68 48
	s	″	s	″	s	″	s	″
(Dec. 30.5)	9.80 +.16	27.4 −1.4	8.31 +.19	25.5 0.0	19.08 +.20	61.3 −0.1	8.54 +.43	55.4 +2.0
Jan. 9.5	9.93 .11	26.0 1.3	8.47 .14	25.5 +0.2	19.26 .14	61.3 +0.1	8.90 .30	57.6 2.3
19.5	10.02 .06	24.8 1.1	8.58 .08	25.8 0.3	19.37 .09	61.4 0.2	9.14 .17	60.0 2.5
29.5	10.06 +.01	23.8 0.9	8.64 +.02	26.2 0.4	19.43 +.03	61.7 0.4	9.25 +.05	62.5 2.5
Feb. 8.4	10.04 −.04	23.0 0.7	8.63 −.03	26.7 0.5	19.44 −.02	62.2 0.5	9.23 −.08	65.1 2.5
18.4	9.99 −.08	22.3 −0.6	8.57 −.08	27.2 +0.6	19.39 −.07	62.7 +0.5	9.09 −.20	67.5 +2.4
28.4	9.89 .12	21.8 0.4	8.47 .12	27.8 0.6	19.30 .12	63.2 0.6	8.83 .31	69.8 2.1
Mar. 10.3	9.76 .14	21.5 0.2	8.32 .16	28.4 0.6	19.16 .15	63.8 0.5	8.47 .40	71.8 1.8
20.3	9.60 .16	21.4 −0.1	8.15 .18	28.9 0.5	19.00 .17	64.3 0.5	8.04 .46	73.4 1.4
30.3	9.43 .17	21.3 0.0	7.96 .19	29.4 0.4	18.82 .18	64.8 0.4	7.55 .50	74.6 1.0
Apr. 9.3	9.26 −.17	21.4 +0.1	7.77 −.19	29.7 +0.3	18.63 −.19	65.2 +0.3	7.03 −.52	75.3 +0.5
19.2	9.09 .16	21.6 0.2	7.58 .18	29.9 +0.1	18.44 .18	65.4 0.2	6.51 .51	75.5 0.0
29.2	8.94 .14	21.9 0.3	7.41 .16	29.9 0.0	18.27 .16	65.5 +0.1	6.00 .48	75.3 −0.5
May 9.2	8.81 .12	22.3 0.4	7.26 .13	29.8 −0.1	18.12 .13	65.5 −0.1	5.55 .44	74.6 1.0
19.2	8.70 .09	22.8 0.5	7.14 .10	29.7 0.2	18.00 .10	65.4 0.2	5.13 .38	73.4 1.4
29.1	8.63 −.06	23.3 +0.6	7.05 −.07	29.4 −0.3	17.91 −.07	65.2 −0.3	4.78 −.30	71.8 −1.8
June 8.1	8.59 −.02	23.9 0.6	7.01 −.03	29.0 0.4	17.86 −.03	64.9 0.3	4.53 .21	69.8 2.1
18.1	8.59 +.01	24.6 0.7	7.00 +.01	28.5 0.5	17.85 +.01	64.5 0.4	4.36 .12	67.6 2.4
28.0	8.62 .05	25.3 0.7	7.03 .05	28.0 0.5	17.88 .05	64.0 0.5	4.29 −.03	65.1 2.6
July 8.0	8.68 .08	26.1 0.7	7.11 .09	27.4 0.6	17.94 .08	63.5 0.5	4.31 +.07	62.5 2.7
18.0	8.78 +.11	26.8 +0.7	7.22 +.13	26.8 −0.6	18.04 +.12	63.0 −0.6	4.43 +.16	59.8 −2.8
28.0	8.91 .14	27.5 0.6	7.36 .16	26.2 0.7	18.18 .15	62.4 0.6	4.63 .25	57.0 2.8
Aug. 6.9	9.07 .17	28.0 0.5	7.54 .19	25.5 0.7	18.34 .18	61.8 0.7	4.93 .34	54.3 2.7
16.9	9.25 .19	28.5 0.4	7.74 .22	24.8 0.7	18.54 .21	61.1 0.7	5.31 .42	51.6 2.6
26.9	9.45 .22	28.9 +0.2	7.97 .24	24.0 0.8	18.76 .24	60.3 0.8	5.76 .49	49.0 2.5
Sept. 5.9	9.68 +.24	29.0 0.0	8.23 +.27	23.2 −0.8	19.01 +.26	59.5 −0.8	6.29 +.56	46.6 −2.3
15.8	9.93 .26	28.9 −0.2	8.51 .29	22.4 0.9	19.28 .28	58.7 0.9	6.88 .62	44.4 2.1
25.8	10.19 .27	28.6 0.4	8.80 .31	21.5 0.9	19.57 .30	57.8 0.9	7.52 .66	42.5 1.8
Oct. 5.8	10.47 .28	28.0 0.7	9.12 .32	20.6 0.9	19.88 .32	56.8 1.0	8.20 .70	40.9 1.4
15.7	10.76 .29	27.2 0.9	9.44 .33	19.7 0.9	20.20 .33	55.8 1.0	8.93 .73	39.6 1.1
25.7	11.06 +.30	26.2 −1.1	9.78 +.34	18.8 −0.9	20.54 +.34	54.8 −1.0	9.67 +.75	38.7 −0.7
Nov. 4.7	11.36 .30	24.9 1.3	10.12 .34	17.9 0.8	20.88 .34	53.8 0.9	10.43 .75	38.2 −0.3
14.7	11.65 .29	23.5 1.5	10.45 .33	17.1 0.8	21.21 .33	52.9 0.9	11.17 .73	38.2 +0.2
24.6	11.94 .27	22.0 1.5	10.78 .31	16.4 0.6	21.54 .32	52.1 0.8	11.90 .70	38.6 0.6
Dec. 4.6	12.20 +.25	20.5 −1.6	11.08 +.29	15.8 −0.5	21.84 +.29	51.4 −0.6	12.57 +.65	39.4 +1.1
14.6	12.44 .22	18.9 1.5	11.36 .26	15.4 0.3	22.13 .26	50.9 0.4	13.19 .57	40.7 1.5
24.6	12.64 .18	17.4 1.5	11.60 .22	15.2 −0.1	22.37 .22	50.6 −0.2	13.72 .48	42.4 1.8
34.5	12.81 +.14	16.0 −1.4	11.79 +.18	15.2 +0.1	22.57 +.18	50.5 0.0	14.14 +.38	44.4 +2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	15 Argus (ι)		η Cancri.		ε Hydræ.		ι Ursæ Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$8^{h}\ 2^{m}$	$-23^{\circ}\ 57'$	$8^{h}\ 25^{m}$	$+20^{\circ}\ 50'$	$8^{h}\ 40^{m}$	$+6^{\circ}\ 50'$	$8^{h}\ 51^{m}$	$+48^{\circ}\ 29'$
	s	″	s	″	s	″	s	″
(Dec. 30.6)	33.42 +.15	58.8 −3.0	55.44 +.22	15.6 −0.7	33.81 +.22	52.9 −1.5	10.26 +.32	57.0 +0.7
Jan. 9.5	33.57 .12	61.8 2.9	55.64 .18	15.0 0.5	34.01 .18	51.4 1.4	10.55 .26	57.9 1.0
19.5	33.66 .07	64.6 2.7	55.80 .13	14.7 0.3	34.17 .13	50.2 1.2	10.78 .19	59.1 1.3
29.5	33.71 +.02	67.3 2.5	55.89 .07	14.5 −0.1	34.27 .08	49.1 1.0	10.94 .12	60.5 1.5
Feb. 8.5	33.70 −.03	69.7 2.3	55.94 +.02	14.6 +0.1	34.33 +.03	48.3 0.7	11.02 +.05	62.2 1.7
18.4	33.64 −.08	71.8 −2.0	55.93 −.03	14.8 +0.3	34.33 −.02	47.6 −0.5	11.04 −.02	63.9 +1.8
28.4	33.54 .12	73.7 1.7	55.88 .08	15.1 0.4	34.29 .06	47.2 0.3	10.98 .09	65.7 1.7
Mar. 10.4	33.40 .15	75.2 1.3	55.78 .11	15.5 0.4	34.20 .10	47.0 −0.2	10.86 .15	67.4 1.7
20.4	33.23 .18	76.3 1.0	55.65 .14	16.0 0.5	34.09 .13	46.9 0.0	10.68 .19	69.0 1.5
30.3	33.05 .19	77.1 0.6	55.50 .16	16.5 0.5	33.95 .15	46.9 +0.1	10.47 .23	70.3 1.2
Apr. 9.3	32.86 −.19	77.5 −0.2	55.33 −.17	16.9 +0.4	33.80 −.16	47.1 +0.2	10 23 −.25	71.5 +1.0
19.3	32.66 .19	77.6 +0.1	55.16 .17	17.3 0.4	33.64 .16	47.4 0.3	9.98 .25	72.3 0.7
29.3	32.48 .18	77.2 0.5	54.99 .16	17.7 0.3	33.49 .15	47.7 0.4	9.73 .25	72.8 +0.3
May 9.2	32.31 .16	76.6 0.8	54.84 .14	17.9 0.2	33.35 .13	48.2 0.4	9.48 .23	72.9 0.0
19.2	32.16 .13	75.6 1.1	54.71 .12	18.1 0.2	33.22 .12	48.6 0.5	9.27 .20	72.7 −0.4
29.2	32.04 −.10	74.4 +1.4	54.60 −.09	18.3 +0.1	33.12 −.09	49.1 +0.5	9.08 −.17	72.1 −0.7
June 8.1	31.96 .07	72.8 1.7	54.53 .06	18.3 0.0	33.04 .07	49.6 0.6	8.92 .13	71.3 1.0
18.1	31.90 −.04	71.0 1.9	54.49 −.03	18.3 −0.1	32.99 .04	50.2 0.6	8.81 .09	70.1 1.3
28.1	31.88 .00	69.1 2.0	54.47 +.01	18.2 0.1	32.97 −.01	50.8 0.6	8.74 −.04	68.8 1.5
July 8.1	31.90 +.03	67.0 2.1	54.50 .04	18.0 0.2	32.98 +.02	51.3 0.5	8.72 .00	67.1 1.7
18.0	31.94 +.07	64.8 +2.1	54.56 +.07	17.7 −0.3	33.01 +.05	51.9 +0.5	8.75 +.05	65.4 −1.9
28.0	32.03 .10	62.7 2.1	54.64 .10	17.4 0.4	33.08 .08	52.3 0.4	8.82 .09	63.4 2.0
Aug. 7.0	32.14 .13	60.6 2.0	54.77 .13	17.0 0.5	33.17 .11	52.7 0.3	8.93 .14	61.4 2.1
17.0	32.29 .16	58.8 1.8	54.91 .16	16.5 0.6	33.30 .14	53.0 +0.2	9.09 .18	59.3 2 1
26.9	32.47 .19	57.1 1.5	55.09 .19	15.9 0.7	33.45 .16	53.1 0.0	9.29 .22	57.2 2.2
Sept. 5.9	32.68 +.22	55.7 +1.2	55.29 +.22	15.1 −0.8	33.62 +.19	53.0 −0.2	9.53 +.26	55.0 −2.2
15.9	32.91 .25	54.8 0.8	55.52 .24	14.3 0.9	33.82 .22	52.7 0.4	9.81 .30	52.8 2.1
25.8	33.17 .27	54.2 +0.3	55.78 .26	13.3 1.0	34.05 .24	52.2 0.6	10.13 .33	50.8 2.0
Oct. 5.8	33.45 .29	54.1 −0.1	56.05 .29	12.2 1.1	34.30 .26	51.5 0.9	10.48 .37	48.8 1.9
15.8	33.74 .30	54.5 0.6	56.35 .31	11.0 1.2	34.58 .28	50.5 1.1	10.86 .40	47.0 1.7
25.8	34.05 +.31	55.4 −1.1	56.66 +.32	9.8 −1.3	34.87 +.30	49.3 −1.3	11.27 +.42	45.3 −1 5
Nov. 4.7	34.37 .31	56.8 1.6	56.98 .33	8.4 1.3	35.17 .31	47.9 1.5	11.70 .43	43.9 1.3
14.7	34.68 .31	58.6 2.0	57.31 .33	7.1 1.3	35.48 .31	46.4 1.6	12.14 .44	42.8 1.0
24.7	34.98 .29	60.8 2.4	57.64 .32	5.8 1.2	35.80 .31	44.7 1.7	12.57 .44	42.0 0.7
Dec. 4.7	35.27 +.27	63.3 −2.6	57.96 +.30	4.6 −1.1	36.10 +.29	43.0 −1.7	13.01 +.42	41.5 −0.3
14.6	35.52 .24	66.0 2.8	58.25 .28	3.6 1.0	36.38 .27	41.3 1.7	13.42 .39	41.4 +0.1
24.6	35.74 .20	68.9 2.9	58.52 .25	2.7 0.8	36.64 .24	39.6 1.6	13.80 .35	41.7 0.5
34.6	35.92 +.15	71.8 −2.9	58.74 +.22	2.0 −0.6	36.87 +.21	38.1 −1.5	14.12 +.31	42.3 +0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ^2 Ursæ Majoris.		κ Cancri.		ι Argus.		1 Draconis (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 9 0	+67° 36′	h m 9 1	+11° 8′	h m 9 13	−58° 46′	h m 9 20	+81° 50′
	s	″	s	″	s	″	s	″
(Dec. 30.6)	3.82 +.52	24.8 +1.4	23.49 +.25	20.9 −1.4	58.65 +.32	45.9 −3.6	18.33+1.31	24.3 +1.8
Jan. 9.6	4.29 .42	26.4 1.9	23.71 .20	19.6 1.2	58.94 .24	49.5 3.7	19.52 1.07	26.3 2.2
19.6	4.66 .31	28.5 2.2	23.89 .15	18.6 1.0	59.14 .16	53.3 3.8	20.46 .79	28.7 2.6
29.5	4.91 .19	30.8 2.4	24.02 .10	17 7 0.7	59.26 +.08	57.1 3.8	21.11 .50	31.5 2.9
Feb. 8.5	5.03 +.06	33.4 2.6	24.09 +.05	17.1 0.5	59.30 .00	61.0 3.7	21.45+ .19	34.4 3.0
18.5	5.03 −.06	35.9 +2.6	24.12 .00	16.7 −0.3	59.26 −.08	64.6 −3.5	21.48− .13	37.4 +3.0
28.4	4.92 .17	38.5 2.5	24.10 −.04	16.5 −0.1	59.14 .15	68.0 3.3	21.20 .43	40.4 2.9
Mar. 10.4	4.69 .27	40.9 2.3	24.03 .08	16.5 +0.1	58.95 .22	71.1 2.9	20.63 .70	43.2 2.7
20.4	4.38 .35	43.0 2.0	23.93 .11	16.6 0.2	58.71 .27	73.9 2.5	19.80 .94	45.7 2.3
30.4	3.99 .41	44.9 1.6	23.81 .13	16.9 0.3	58.42 .31	76.2 2.1	18.75 1.13	47.9 1.9
Apr. 9.3	3.55 −.46	46.3 +1.2	23.66 −.15	17.2 +0.4	58.09 −.34	78.1 −1.6	17.54−1.27	49.6 +1.4
19.3	3.07 .48	47.2 0.7	23.51 .15	17.6 0.4	57.74 .35	79.5 1.2	16.21 1.36	50.8 0.9
29.3	2.59 .48	47.7 +0.2	23.36 .15	18.0 0.4	57.38 .36	80.4 0.6	14.82 1.40	51.4 +0.3
May 9.3	2.12 .46	47.7 −0.3	23.22 .14	18.4 0.4	57.02 .36	80.8 −0.1	13.42 1.38	51.4 −0.2
19.2	1.68 .42	47.2 0.7	23.09 .13	18.9 0.4	56.67 .34	80.7 +0.4	12.06 1.32	50.9 0.8
29.2	1.28 −.37	46.2 −1.2	22.97 −.10	19.3 +0.4	56.34 −.32	80.0 +0.9	10.79−1.21	49.8 −1.3
June 8.2	0.94 .31	44.8 1.6	22.89 .08	19.7 0.4	56.03 .29	78.9 1.4	9.64 1.07	48.2 1.8
18.1	0.67 .23	43.1 2.0	22.82 .05	20.1 0.4	55.76 .25	77.3 1.8	8.66 .89	46.2 2.2
28.1	0.47 .16	40.9 2.3	22.79 −.02	20.5 0.3	55.53 .21	75.3 2.2	7.86 .70	43.8 2.6
July 8.1	0.36 −.08	38.5 2.5	22.78 +.01	20.8 0.3	55.35 .16	72.9 2.5	7.27 .48	41.0 2.9
18.1	0.32 +.01	35.9 −2.7	22.80 +.04	21.1 +0.2	55.22 −.10	70.3 +2.6	6.89− .26	38.0 −3.1
28.0	0.37 .09	33.1 2.8	22.85 .06	21.3 +0.1	55.15 −.04	67.4 2.9	6.74− .03	34.7 3.3
Aug. 7.0	0.50 .17	30.2 2.9	22.93 .09	21.4 0.0	55.14 +.02	64.5 3.0	6.83+ .20	31.3 3.4
17.0	0.72 .25	27.2 3.0	23.03 .12	21.3 −0.1	55.20 .09	61.5 2.9	7.14 .43	27.9 3.4
27.0	1.01 .33	24.3 2.9	23.17 .15	21.1 0.3	55.32 .16	58.6 2.8	7.68 .65	24.5 3.4
Sept. 5.9	1.37 +.40	21.4 −2.8	23.33 +.18	20.8 −0.4	55.52 +.23	55.9 +2.6	8.43+ .86	21.1 −3.3
15.9	1.81 .47	18.6 2.7	23.52 .20	20.2 0.6	55.77 .29	53.5 2.2	9.39 1.05	17.9 3.1
25.9	2.31 .53	16.0 2.5	23.73 .23	19.5 0.8	56.09 .35	51.5 1.8	10.54 1.24	14.9 2.9
Oct. 5.8	2.88 .59	13.7 2.2	23.98 .26	18.6 1.0	56.47 .40	50.0 1.2	11.86 1.40	12.2 2.5
15.8	3.49 .64	11.6 1.9	24.24 .28	17.4 1.3	56.90 .45	49.0 +0.6	13.33 1.54	9.8 2.2
25.8	4.15 +.68	9.8 −1.6	24.53 +.30	16.1 −1.4	57.36 +.48	48.7 0.0	14.93+1.64	7.9 −1.7
Nov. 4.8	4.85 .70	8.4 1.2	24.84 .31	14.6 1.6	57.85 .50	49.0 −0.6	16.62 1.72	6.4 1.2
14.7	5.56 .71	7.5 0.7	25.15 .32	13.0 1.6	58.36 .50	50.0 1.3	18.37 1.76	5.4 0.7
24.7	6.27 .70	7.0 −0.2	25.47 .32	11.3 1.7	58.86 .49	51.5 1.9	20.13 1.75	5.0 −0.2
Dec. 4.7	6.96 +.68	7.1 +0.3	25.78 +.31	9.6 −1.7	59.33 +.46	53.8 −2.5	21.86+1.69	5.1 +0.4
14.7	7.62 .63	7.6 0.8	26.09 .29	8.0 1.6	59.77 .42	56.5 2.9	23.51 1.58	5.8 1.0
24.6	8.22 .56	8.6 1.2	26.36 .26	6.5 1.5	60.16 .36	59.6 3.3	25.02 1.42	7.0 1.5
34.6	8.74 +.48	10.1 +1.6	26.61 +.23	5.1 −1.3	60.49 +.29	63.1 −3.6	26.35+1 21	8.8 +1.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Hydræ.		*d* Ursæ Majoris		*θ* Ursæ Majoris.		*ε* Leonis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 21	° ′ −8 8	h m 9 24	° ′ +70 20	h m 9 24	° ′ +52 12	h m 9 39	° ′ +24 18
	s	″	s	″	s	″	s	″
(Dec. 30.6)	49.36 +.25	59.4 −2.3	5.67 +.61	30.8 +1.3	60.19 +.38	31.7 +0.6	11.17 +.29	45.7 −0.9
Jan. 9.6	49.59 .21	61.6 2.2	6.24 .51	32.3 1.8	60.54 .32	32.4 1.0	11.44 .25	44.9 0.6
19.6	49.77 .16	63.8 2.1	6.70 .40	34.4 2.2	60.82 .25	33.6 1.3	11.67 .20	44.5 −0.3
29.5	49.91 .11	65.9 1.9	7.03 .26	36.7 2.5	61.04 .18	35.1 1.6	11.84 .15	44.3 0.0
Feb. 8.5	50.00 .06	67.7 1.7	7.22 +.13	39.3 2.6	61.18 .10	36.8 1.8	11.97 .10	44.5 +0.2
18.5	50.04 +.01	69.3 −1.5	7.29 −.01	42.0 +2.7	61.23 +.02	38.8 +2.0	12.04 +.04	44.8 +0.5
28.4	50.03 −.03	70 6 1.2	7.21 .14	44.7 2.7	61.22 −.05	40.8 2.0	12.05 −.01	45.4 0.7
Mar. 10.4	49.98 .07	71.7 0.9	7.01 .26	47.3 2.5	61.12 .12	42.8 2.0	12.02 .05	46.2 0.8
20.4	49.89 .10	72.5 0.7	6.70 .36	49.7 2.3	60.97 .18	44.7 1.8	11.95 .09	47.0 0.9
30.4	49.78 .12	73.1 0 4	6.29 .44	51.8 2.0	60.77 .22	46.4 1.6	11.84 .12	47.9 0.9
Apr. 9.3	49.64 −.14	73.4 −0.2	5.82 −.50	53.5 +1.5	60.53 −.25	47.9 +1.3	11.70 −.14	48.7 +0.8
19.3	49.50 .15	73.5 0.0	5.29 .54	54.7 1.0	60.27 .27	49.1 1.0	11.55 .15	49.6 0.8
29.3	49 35 .15	73.4 +0.2	4.75 .55	55.5 +0.5	60.00 .27	49.9 0.6	11.40 .16	50.3 0.7
May 9.3	49.21 .14	73.0 0.4	4.20 .54	55.8 0.0	59.73 .26	50.4 +0.2	11.24 .15	50.9 0.6
19.2	49.07 .13	72.5 0.6	3.67 .51	55.5 −0 5	59.47 .24	50.4 −0.1	11.09 .14	51.4 0.4
29.2	48.96 −.11	71.8 +0.8	3.19 −.46	54.8 −1.0	59.24 −.22	50.1 −0.5	10.96 −.12	51.7 +0.3
June 8.2	48.85 .09	71.0 0.9	2.75 .40	53.5 1.4	59.04 .18	49.4 0.9	10.85 .10	51.9 +0.1
18.1	48.77 .07	70.0 1.0	2.38 .33	51.9 1.9	58.87 .14	48.3 1.2	10.75 .08	51.9 −0.1
28.1	48.72 .05	69.0 1.1	2.09 .25	49.8 2.2	58.75 .10	46.9 1.5	10.69 .05	51.8 0.2
July 8.1	48.68 −.02	67.8 1.2	1.89 .16	47.5 2.5	58.67 .06	45.3 1.8	10.65 −.03	51.5 0.4
18.1	48.68 +.01	66.6 +1.2	1.77 −.07	44.8 −2.7	58.64 −.01	43.4 −2.0	10.63 .00	51.0 −0.5
28.0	48 70 .03	65.4 1.2	1.75 +.02	42.0 2.9	58.65 +.04	41.3 2.2	10.65 +.03	50.4 0.7
Aug. 7.0	48.75 .06	64.3 1.1	1.81 .11	38.9 3.1	58.72 .09	39.0 2.3	10.69 .06	49.7 0.8
17.0	48.82 .09	63.2 1.0	1.97 .20	35.8 3.1	58.82 .13	36.7 2.4	10.76 .09	48.8 1.0
27.0	48.93 .12	62.4 0.8	2.22 .29	32.7 3.1	58.98 .18	34.2 2.5	10.87 .12	47.8 1.1
Sept. 5.9	49.06 +.15	61.7 +0.5	2.55 +.38	29.6 −3.1	59.18 +.23	31.7 −2.5	11.00 +.15	46.6 −1.3
15.9	49.23 .18	61.3 +0.3	2.98 .46	26.5 3.0	59.43 .27	29.1 2.5	11.17 .18	45.2 1.4
25.9	49.43 .21	61.1 0.0	3.48 .54	23.7 2.8	59.72 .31	26.7 2.4	11.37 .21	43.8 1.5
Oct. 5.8	49.65 .24	61.4 −0.4	4.06 .61	21.0 2.6	60.06 .36	24.3 2.3	11.59 .24	42.2 1.6
15.8	49.90 .26	61.9 0.7	4.70 .68	18.6 2.2	60.43 .39	22.0 2.2	11.85 .27	40.5 1.7
25.8	50.18 +.29	62.8 −1.1	5.41 +.73	16.5 −1.9	60.84 +.43	20.0 −1.9	12.14 +.30	38.7 −1.8
Nov. 4.8	50.47 .30	64.0 1.4	6.16 .77	14.8 1.5	61.28 .45	18.1 1.7	12.45 .32	36.9 1.8
14.7	50.78 .31	65.7 1.7	6.94 .79	13.6 1.0	61.74 .46	16.6 1.3	12.79 .34	35.2 1.7
24.7	51.10 .31	67.5 2.0	7.73 .79	12.8 −0.5	62.21 .47	15.5 1.0	13.13 .34	33.4 1.7
Dec. 4.7	51.41 +.31	69.6 −2.2	8.52 +.77	12.6 0.0	62.68 +.46	14.7 −0.6	13.47 +.34	31.8 −1.5
14.7	51.71 .29	71.8 2.3	9.27 .73	12.9 +0.6	63.14 .44	14.4 −0.2	13.81 .33	30.4 1.3
24.6	51.99 .26	74.1 2.3	9.97 .66	13.7 1.1	63.56 .40	14.4 +0.3	14.13 .30	29.3 1.0
34.6	52.24 +.23	76.4 −2.3	10.59 +.57	15.0 +1.6	63.94 +.36	15.0 +0.7	14.42 + 27	28.4 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Leonis.		α Leonis. (*Regulus.*)		32 Ursæ Majoris.		γ¹ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 46	° ′ +26 38	h m 10 2	° ′ +12 32	h m 10 9	° ′ +65 41	h m 10 13	° ′ +20 25
	s	″	s	″	s	″	s	″
(Dec. 30.6)	5.10 +.30	27.6 −0.9	7.09 +.29	23.6 −1.5	29.96 +.58	23.0 +0.7	29.79 +.30	61.6 −1.3
Jan. 9.6	5.38 .26	26.9 0.5	7.36 .25	22.2 1.3	30.59 .51	23.9 1.2	30.07 .27	60.5 1.0
19.6	5.62 .21	26.6 −0.2	7.60 .21	21.0 1.1	30.97 .43	25.3 1.6	30.32 .23	59.7 0.7
29.6	5.80 .16	26.5 +0.1	7.78 .16	20.0 0.8	31.34 .32	27.2 2.1	30.53 .18	59.2 0.4
Feb. 8.5	5.94 .10	26.8 0.4	7.92 .11	19.4 0.5	31.62 .22	29.4 2.4	30.69 .13	59.0 −0.1
18.5	6.01 +.05	27.3 +0.6	8.01 +.06	19.0 −0.3	31.78 +.11	31.9 +2.6	30.79 +.08	59.1 +0.2
28.5	6.04 .00	28.0 0.8	8.04 +.01	18.8 0.0	31.83 .00	34.5 2.7	30.84 +.03	59.4 0.4
Mar. 10.5	6.01 −.05	28.8 0.9	8.04 −.03	18.9 +0.2	31.77 −.11	37.2 2.6	30.85 −.02	59.9 0.6
20.4	5.94 .09	29.8 1.0	7.99 .07	19.2 0.3	31.62 .20	39.8 2.5	30.81 .06	60.6 0.7
30.4	5.83 .12	30.8 1.0	7.91 .09	19.6 0.4	31.37 .28	42.2 2.3	30.73 .09	61.4 0.8
Apr. 9.4	5.70 −.14	31.8 +0.9	7.80 −.12	20.1 +0.5	31.06 −.35	44.3 +1.9	30.63 −.11	62.3 +0.9
19.3	5.55 .16	32.7 0.9	7.68 .13	20.6 0.6	30.69 .40	46.0 1.5	30.50 .13	63.2 0.9
29.3	5.39 .16	33.5 0.7	7.54 .14	21.2 0.6	30.28 .42	47.4 1.1	30.37 .14	64.0 0.8
May 9.3	5.23 .16	34 1 0.6	7.41 .14	21.8 0.6	29.86 .43	48.2 0.6	30.23 .14	64.7 0.7
19.3	5.08 .15	34.6 0.4	7.27 .13	22.4 0.6	29.44 .42	48.6 +0.2	30.09 .14	65.4 0.6
29.2	4.94 −.13	35.0 +0.2	7.15 −.12	22.9 +0.5	29.02 −.40	48.5 −0.4	29.96 −.13	65.9 +0.5
June 8.2	4.82 .11	35.1 +0.1	7.04 .10	23.4 0.5	28.64 .37	47.9 0.8	29.84 .11	66.3 0.3
18.2	4.72 .09	35.1 −0.1	6.95 .08	23.8 0.4	28.30 .32	46.9 1.3	29.74 .09	66.5 +0.2
28.2	4.65 .06	34.9 0.3	6.87 .06	24.2 0.3	28.00 .27	45.4 1.7	29.65 .07	66.6 0.0
July 8.1	4.60 .04	34.5 0.5	6.82 .04	24.5 0.2	27.76 .21	43.5 2.1	29.59 .05	66.6 −0.1
18.1	4.58 −.01	34.0 −0.6	6.79 −.02	24.6 +0.1	27.59 −.15	41.3 −2.4	29.55 −.03	66.4 −0.3
28.1	4.58 +.02	33.3 0.8	6.78 +.01	24.7 0.0	27.47 .08	38.8 2.7	29.53 .00	66.0 0.4
Aug. 7.0	4.62 .05	32.4 0.9	6.80 .03	24.6 −0.1	27.42 −.01	36.0 2.9	29.54 +.02	65.5 0.6
17.0	4.69 .08	31.4 1.1	6.85 .06	24.4 0.3	27.45 +.06	33.0 3.1	29.58 .05	64.8 0.8
27.0	4.78 .11	30.2 1.3	6.92 .09	24.0 0.5	27.55 .13	29.9 3.2	29.64 .08	64.0 1.0
Sept. 6.0	4.91 +.14	28.8 −1.4	7.02 +.12	23.4 −0.7	27.72 +.21	26.7 −3.2	29.74 +.11	62.9 −1.1
15.9	5.07 .18	27.4 1.5	7.16 .15	22.7 0.9	27.96 .28	23.5 3.2	29.87 .14	61.7 1.3
25.9	5.27 .21	25.8 1.7	7.32 .18	21.7 1.1	28.28 .35	20.4 3.1	30.03 .18	60.3 1.5
Oct. 5.9	5.49 .24	24.1 1.8	7.52 .21	20.6 1.3	28.66 .42	17.3 3.0	30.22 .21	58.7 1.6
15.9	5.75 .27	22.3 1.8	7.75 .24	19.2 1.5	29.12 .49	14.4 2.8	30.45 .24	57.0 1.8
25.8	6.04 +.30	20.4 −1.9	8.02 +.27	17.7 −1.6	29.63 +.55	11.8 −2.5	30.71 +.28	55.2 −1.9
Nov. 4.8	6.35 .32	18.6 1.8	8.29 .30	16.0 1.8	30.20 .59	9.5 2.1	31.00 .30	53.3 1.9
14.8	6.68 .34	16.7 1.8	8.60 .32	14.1 1.9	30.82 .63	7.6 1.7	31.31 .32	51.3 2.0
24.7	7.03 .35	15.0 1.7	8.92 .33	12.3 1.9	31.46 .65	6.1 1.3	31.64 .34	49.4 1.9
Dec. 4.7	7.38 +.35	13.4 −1.5	9.25 +.33	10.4 −1.9	32.11 +.66	5.1 −0.8	31.98 +.34	47.5 −1.8
14.7	7.73 .34	12.0 1.3	9.57 .32	8.6 1.8	32.76 .64	4.6 −0.2	32.32 .33	45.8 1.6
24.7	8.05 .31	10.9 1.0	9.88 .30	6.8 1.6	33.39 .61	4.7 +0.4	32.65 .32	44.3 1.4
34.6	8.35 +.28	10.1 −0.7	10.17 +.27	5.3 −1.4	33.97 +.55	5.3 +0.8	32.95 +.29	43.0 −1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	9 Draconis (H.)		ρ Leonis.		η Argus.		*l* Leonis.	
	Right Ascension.	**Declination** *North.*	**Right Ascension.**	**Declination** *North.*	**Right Ascension.**	**Declination** *South.*	**Right Ascension.**	**Declination** *North.*
	h m 10 25	° ′ +76 18	h m 10 26	° ′ +9 54	h m 10 40	° ′ −59 8	h m 10 43	° ′ +11 9
	s	″	s	″	s	″	s	″
(Dec. 30.6)	5.93 +.96	47.6 +0.9	37.60 +.30	36.0 −1.7	31.55 +.45	44.7 −2.8	4.92 +.31	56.8 −1.8
Jan. 9.6	6.84 .85	48.7 1.4	37.89 .27	34.4 1.5	31.98 .40	47.8 3.2	5.21 .28	55.2 1.5
19.6	7.62 .72	50.4 1.9	38.14 .23	33.0 1.3	32.34 .33	51.1 3.5	5.47 .24	53.8 1.3
29.6	8.27 .56	52.5 2.3	38.34 .18	31.8 1.0	32.64 .26	54.7 3.7	5.69 .20	52.6 1.0
Feb. 8.5	8.74 .39	55.0 2.6	38.50 .13	31.0 0.7	32.86 .18	58 5 3.7	5.87 .15	51.8 0.7
18.5	9.04 +.20	57.8 +2.9	38.61 +.09	30.4 −0.5	33.00 +.10	62.2 −3.7	6.00 +.10	51.3 −0.4
28.5	9.14 +.01	60.8 3.0	38.68 +.04	30.0 −0.2	33.06 +.03	65.9 3.6	6.08 .06	51.0 −0.1
Mar. 10.5	9.06 −.17	63.7 2.9	38.69 .00	30.0 0.0	33.05 −.05	69.4 3.4	6.11 +.01	51.0 +0.1
20.4	8.81 .33	66.6 2.8	38.67 −.04	30.1 +0.2	32.97 .11	72.8 3.2	6.10 −.03	51.2 0.3
30.4	8.40 .48	69.2 2.5	38.61 .07	30.4 0.4	32.83 .17	75.8 2.9	6.06 .06	51.6 0.4
Apr. 9.4	7.86 −.60	71.6 +2.2	38.52 −.10	30.8 +0.5	32.64 −.21	78.5 −2.5	5.99 −.08	52.1 +0.6
19.4	7.20 .69	73.6 1.7	38.42 .11	31.3 0.6	32.40 .25	80.8 2.1	5.89 .10	52.7 0.6
29.3	6.47 .76	75.0 1.2	38.30 .12	31.9 0.6	32.14 .28	82.6 1.7	5.78 .12	53.4 0.7
May 9.3	5.69 .79	76.0 0.7	38.17 .13	32.5 0.6	31.84 .30	84.1 1.2	5.66 .12	54.1 0.7
19.3	4.89 .80	76.5 +0.2	38.05 .12	33.1 0.6	31.54 .31	85.0 0.7	5.54 .12	54.7 0.7
29.3	4.10 −.78	76.4 −0.4	37.92 −.12	33.8 +0.6	31.22 −.32	85.4 −0.2	5.42 −.12	55.4 +0.6
June 8.2	3.35 .73	75.7 0.9	37.81 .11	34.3 0.5	30.91 .31	85.3 +0.3	5.30 .11	56.0 0.6
18.2	2.65 .67	74.6 1.4	37.71 .09	34.8 0.5	30.60 .30	84.8 0.8	5.20 .10	56.5 0.5
28.2	2.02 .58	72.9 1.9	37 63 .08	35.3 0.4	30.31 .28	83.7 1.3	5.11 .08	57.0 0.4
July 8.1	1.49 .48	70.8 2.3	37.56 .06	35.7 0.3	30.05 .25	82.2 1.7	5.03 .07	57.3 0.3
18.1	1.06 −.38	68.3 −2.7	37.52 −.04	36.0 +0.2	29.81 −.21	80.3 +2.1	4.97 −.05	57.5 +0.2
28.1	0.74 .26	65.5 3.0	37.49 −.02	36.2 +0.1	29.62 .17	78.0 2.4	4.93 .03	57.7 +0.1
Aug. 7.1	0.54 .14	62.4 3.2	37.48 +.01	36.2 0.0	29.48 .12	75.5 2.6	4.91 −.01	57.7 −0.1
17.0	0.47 −.01	59.1 3.4	37.51 .04	36.1 −0.2	29.39 −.06	72.7 2.8	4.92 +.02	57.5 0.3
27.0	0.52 +.13	55.7 3.5	37.55 .06	35.9 0.3	29.37 +.01	69.9 2.8	4.95 .05	57.2 0.4
Sept. 6.0	0.71 +.25	52.2 −3.5	37.63 +.09	35.4 −0.5	29.41 +.06	67.1 +2.8	5.01 +.08	56.6 −0.6
16.0	1.03 .38	48.6 3.5	37.74 .12	34.8 0.7	29.52 .15	64.4 2.6	5.10 .11	55.9 0.8
25.9	1.48 .51	45.2 3.4	37.88 .16	34.0 1.0	29.71 .23	61.8 2.4	5.23 .14	55.0 1.0
Oct. 5.9	2.05 .63	41.9 3.2	38.05 .19	32.9 1.2	29.96 .30	59.6 2.0	5.39 .18	53.8 1.3
15.9	2.74 .75	38.8 3.0	38.26 .22	31.6 1.4	30.31 .36	57.9 1.5	5.58 .21	52.4 1.5
25.8	3.54 +.85	36.0 −2.6	38.50 +.26	30.1 −1.6	30.70 +.42	56.6 +1.0	5.81 +.25	50.8 −1.7
Nov. 4.8	4.44 .94	33.5 2.2	38.78 .29	28.4 1.8	31.15 .47	55.9 +0.4	6.08 .28	49.1 1.8
14.8	5.42 1.01	31.5 1.8	39.07 .31	26.5 1.9	31.64 .51	55.8 −0.2	6.37 .30	47.2 2.0
24.7	6.45 1.05	30.0 1.2	39.39 .32	24.6 2.0	32.16 .52	56.4 0.9	6.68 .32	45.2 2.0
Dec. 4.7	7.51+1.07	29.0 −0.7	39.72 +.33	22.6 −2.0	32.69 +.53	57.6 −1.5	7.00 +.33	43.1 −2.0
14.7	8.58 1.05	28.6 −0.1	40.04 .32	20.6 1.9	33.21 .51	59.3 2.0	7.34 .33	41.1 1.9
24.7	9.60 1.00	28.8 +0.5	40.36 .31	18.7 1.8	33.71 .48	61.6 2.5	7.66 .32	39.2 1.8
34.6	10.57+ .92	29.6 +1.1	40.66 +.29	17.0 −1.6	34.17 +.43	64 4 −3.0	7.97 +.30	37.5 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Majoris.		δ Leonis.		δ Crateris.		τ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	10ʰ 56ᵐ	+62° 22′	11ʰ 7ᵐ	+21° 9′	11ʰ 13ᵐ	−14° 8′	11ʰ 21ᵐ	+3° 29′
	s	″	s	″	s	″	s	″
(Dec. 30.7)	28.12 +.56	51.4 0.0	51.41 +.33	56.5 −1.5	28.08 +.31	28.9 −2.4	53.56 +.32	71.6 −2.0
Jan. 9.7	28.66 .51	51.7 +0.6	51.73 .31	55.1 1.2	28.38 .29	31.2 2.4	53.86 .30	69.7 1.9
19.6	29.15 .45	52.5 1.1	52.02 .27	54.0 0.9	28.66 .26	33.6 2.4	54.15 .27	67.9 1.7
29.6	29.56 .37	53.9 1.6	52.27 .23	53.3 0.5	28.90 .22	36.0 2.3	54.39 .23	66.3 1.5
Feb. 8.6	29.90 .29	55.7 2.0	52.47 .18	53.0 −0.2	29.10 .17	38.2 2.1	54.60 .18	65.0 1.2
18.5	30.13 +.19	57.9 +2.3	52.63 +.14	53.0 +0.2	29.25 +.13	40.2 −1.9	54.76 +.14	63.9 0.9
28.5	30.28 +.10	60.3 2.5	52.74 .09	53.3 0.5	29.35 .09	42.0 1.7	54.88 .09	63.1 0.6
Mar. 10.5	30.33 .00	62.9 2.7	52.80 +.04	53.9 0.7	29.42 +.04	43.5 1.4	54.95 .05	62.6 0.4
20.5	30.28 −.09	65.6 2.6	52.82 .00	54.7 0.9	29.44 .00	44.8 1.2	54.98 +.01	62.4 −0.1
30.4	30.16 .16	68.2 2.5	52.79 −.04	55.7 1.1	29.42 −.03	45.9 0.9	54.98 −.02	62.4 +0.1
Apr. 9.4	29.96 −.23	70.6 +2.3	52.74 −.07	56.7 +1.1	29.38 −.06	46.7 −0.7	54.94 −.05	62.5 +0.3
19.4	29.69 .29	72.8 2.0	52.65 .10	57.8 1.1	29.31 .08	47.2 0.4	54.88 .07	62.9 0.4
29.4	29.39 .33	74.6 1.6	52.55 .11	58.9 1.0	29.22 .10	47.6 −0.2	54.80 .09	63.3 0.5
May 9.3	29.05 .35	76.1 1.2	52.43 .12	59.9 1.0	29.12 .11	47.7 0.0	54.70 .10	63.8 0.6
19.3	28.69 .36	77.1 0.8	52.30 .13	60.8 0.9	29.00 .11	47.6 +0.2	54.60 .11	64.4 0.6
29.3	28.33 −.36	77.6 +0.3	52.17 −.13	61.6 +0.7	28.89 −.12	47.2 +0.4	54.49 −.11	65.1 +0.6
June 8.2	27.98 .34	77.6 −0.2	52.05 .12	62.3 0.6	28.77 .11	46.7 0.6	54.38 .11	65.7 0.6
18.2	27.64 .32	77.2 0.7	51.93 .11	62.7 0.4	28.66 .11	46.0 0.8	54.27 .10	66.4 0.6
28.2	27.34 .29	76.3 1.1	51.82 .10	63.0 +0.2	28.55 .10	45.2 0.9	54.17 .10	67.0 0.6
July 8.2	27.07 .25	75.0 1.6	51.72 .09	63.1 0.0	28.46 .09	44.2 1.0	54.08 .09	67.6 0.6
18.1	26.84 −.21	73.2 −1.9	51.64 −.07	63.0 −0.2	28.37 −.08	43.2 +1.1	54.00 −.07	68.2 +0.5
28.1	26.65 .16	71 1 2.3	51.58 .05	62.7 0.4	28.30 .06	42.1 1.1	53.93 .06	68.6 0.4
Aug. 7.1	26.52 .10	68.6 2.6	51.54 −.03	62.2 0.6	28.25 .04	40.9 1.1	53.88 .04	69.0 0.3
17.1	26.45 −.04	65.9 2.9	51.52 .00	61.5 0.8	28.22 −.02	39.8 1.1	53.85 −.02	69.2 +0.2
27.0	26.44 +.02	62.9 3.1	51.52 +.02	60.6 1.0	28.21 +.01	38.7 1.0	53.85 +.01	69.3 0.0
Sept. 6.0	26.48 +.08	59.8 −3.2	51.56 +.05	59.5 −1.2	28.24 +.04	37.8 +0.9	53.86 +.04	69.2 −0.2
16.0	26.60 .15	56.5 3.3	51.63 .09	58.1 1.4	28.30 .08	37.0 0.7	53.92 .07	68.9 0.4
25.9	26.78 .22	53.2 3.3	51.73 .12	56.6 1.6	28.39 .11	36.5 0.4	54.00 .10	68.4 0.6
Oct. 5.9	27.03 .28	49.9 3.3	51.87 .16	54.8 1.8	28.52 .15	36.2 +0.1	54.12 .14	67.7 0.9
15.9	27.35 .35	46.7 3.2	52.05 .20	52.9 2.0	28.70 .19	36.3 −0.3	54.28 .18	66.6 1.2
25.9	27.73 +.42	43.6 −2.9	52.27 +.24	50.9 −2.1	28.91 +.23	36.7 −0.6	54.48 +.22	65.4 −1.4
Nov. 4.8	28.18 .47	40.8 2.7	52.52 .27	48.7 2.2	29.16 .26	37.5 1.0	54.72 .25	63.8 1.6
14.8	28.68 .52	38.2 2.3	52.81 .30	46.5 2.2	29.44 .30	38.6 1.3	54.98 .28	62.1 1.8
24.8	29.22 .56	36.1 1.9	53.12 .32	44.3 2.2	29.75 .32	40.2 1.6	55.28 .31	60.2 2.0
Dec. 4.8	29.79 +.58	34.4 −1.4	53.46 +.34	42.2 −2.1	30.07 +.33	41.9 −1.9	55.60 +.32	58.1 −2.1
14.7	30.38 .59	33.2 0.9	53.80 .34	40.2 1.9	30.40 .33	44.0 2.1	55.92 .33	56.0 2.1
24.7	30.96 .57	32.6 −0.4	54.14 .34	38.4 1.7	30.73 .32	46.2 2.3	56.25 .32	53.9 2.1
34.7	31.52 +.54	32.5 +0.2	54.47 +.32	36.8 −1.4	31.05 +.30	48.5 −2.4	56.56 +.31	51.9 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Draconis.		υ Leonis.		β Leonis.		γ Ursæ Majoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$11^{h}\ 24^{m}$	$+69^{\circ}\ 58'$	$11^{h}\ 30^{m}$	$-0^{\circ}\ 10'$	$11^{h}\ 43^{m}$	$+15^{\circ}\ 13'$	$11^{h}\ 47^{m}$	$+54^{\circ}\ 20'$
	s	″	s	″	s	″	s	″
(Dec. 30.7)	24.70 +.73	30.0 −0.1	55.82 +.32	29.1 −2.1	3.69 +.33	40.4 −1.8	38.36 +.48	38.9 −0.9
Jan. 9.7	25.41 .69	30.2 +0.5	56.14 .30	31.2 2.0	4.01 .31	38.7 1.6	38.83 .46	38.3 −0.3
19.6	26.07 .62	31.0 1.1	56.42 .27	33.1 1.9	4.31 .28	37.2 1.3	39.28 .42	38.2 +0.3
29.6	26.66 .53	32.4 1.6	56.67 .24	34.9 1.6	4.58 .25	36.1 1.0	39.67 .37	38.8 0.8
Feb. 8.6	27.14 .43	34.2 2.1	56.88 .20	36.4 1.4	4.81 .21	35.3 0.6	40.02 .31	39.9 1.3
18.6	27.51 +.31	36.5 +2.5	57.06 +.15	37.6 −1.1	4.99 +.16	34.9 −0.3	40.30 +.24	41.4 +1.8
28.5	27.76 .19	39.1 2.7	57.18 .10	38.6 0.9	5.13 .12	34.8 0.0	40.50 .17	43.4 2.1
Mar. 10.5	27.89 +.06	42.0 2.9	57.26 .06	39.4 0.6	5.23 .07	35.0 +0.3	40.64 .10	45.6 2.4
20.5	27.88 −.06	44.9 2.9	57.30 +.02	39.8 0.3	5.28 +.03	35.5 0.6	40.69 +.02	48.1 2.5
30.4	27.76 .17	47.8 2.8	57.30 −.01	40.1 −0.1	5.29 −.01	36.2 0.8	40.68 −.04	50.6 2.6
Apr. 9.4	27.54 −.27	50.5 +2.6	57.28 −.04	40.1 +0.1	5.27 −.04	37.0 +0.9	40.61 −.10	53.2 +2.5
19.4	27.21 .36	53.0 2.3	57.22 .06	40.0 0.2	5.22 .06	37.9 1.0	40.48 .15	55.6 2.3
29.4	26.82 .43	55.2 1.9	57.15 .08	39.7 0.4	5.14 .08	38.9 1.0	40.30 .19	57.8 2.1
May 9.3	26.36 .48	56.9 1.5	57.06 .09	39.3 0.5	5.05 .10	39.9 1.0	40.09 .22	59.7 1.8
19.3	25.87 .51	58.2 1.0	56.96 .10	38.8 0.5	4.95 .11	40.9 0.9	39.86 .25	61.3 1.4
29.3	25.36 −.52	59.0 +0.5	56.86 −.11	38.2 +0.6	4.84 −.11	41.8 +0.8	39.60 −.26	62.5 +1.0
June 8.3	24.84 .51	59.2 0.0	56.75 .11	37.6 0.7	4.72 .12	42.6 0 7	39.34 .26	63.3 0.6
18.2	24.33 .50	58.9 −0.5	56.64 .10	36.9 0.7	4.61 .11	43.2 0.6	39.08 .26	63.6 +0.1
28.2	23.85 .46	58.2 1.1	56.54 .10	36.2 0.7	4.50 .11	43.8 0.4	38.83 .25	63.5 −0.4
July 8.2	23.40 .42	56.9 1.5	56.45 .09	35.5 0.7	4.39 .10	44.1 0.3	38.59 .23	62.9 0.8
18.1	23.00 −.37	55.1 −2.0	56.36 −.08	34.9 +0.6	4.29 −.09	44.3 +0.1	38.37 −.21	61.9 −1.2
28.1	22.66 .31	53.0 2.4	56.29 .07	34.3 0.6	4.21 .08	44.4 −0.1	38.18 .18	60.4 1.6
Aug. 7.1	22.38 .24	50.4 2.7	56.23 .06	33.8 0.5	4.14 .06	44.2 0.3	38.01 .15	58.6 2.0
17.1	22.18 .16	47.5 3.0	56.19 −.03	33.3 0.4	4.09 .04	43.9 0.5	37.88 .11	56.5 2.3
27.0	22.06 −.08	44.4 3.2	56.18 .00	33.0 +0.2	4.06 −.01	43.3 0.7	37.80 .07	54.0 2.6
Sept. 6.0	22.02 .00	41.0 −3.4	56.19 +.03	32.9 0.0	4.06 +.01	42.5 −0.9	37.75 −.02	51.2 −2.9
16.0	22.06 +.09	37.6 3.5	56.23 .06	33.0 −0.2	4.08 .04	41.5 1.1	37.76 +.03	48.3 3.1
26.0	22.20 .19	34.0 3.6	56.31 .09	33.3 0.4	4.15 .08	40.3 1.3	37.82 .09	45.1 3.2
Oct. 5.9	22.44 .28	30.4 3.5	56.42 .13	33.8 0.7	4.25 .12	38.9 1.6	37.94 .15	41.9 3.3
15.9	22.76 .39	26.9 3.4	56.57 .17	34.6 1.0	4.38 .16	37.2 1.8	38.12 .21	38.6 3.3
25.9	23.18 +.48	23.6 −3.2	56.76 +.21	35.8 −1.2	4.57 +.20	35.3 −2.0	38.35 +.27	35.3 −3.3
Nov. 4.8	23.70 .55	20.4 3.0	56.99 .25	37.1 1.5	4.79 .24	33.3 2.1	38.65 .33	32.1 3.1
14.8	24.29 .63	17.6 2.6	57.25 .28	38.7 1.7	5.04 .27	31.2 2.2	39.01 .38	29.1 2.9
24.8	24.95 .69	15.3 2.2	57.55 .30	40.6 1.9	5.33 .30	28.9 2.2	39.41 .42	26.4 2.6
Dec. 4.8	25.66 +.73	13.3 −1.7	57.86 +.32	42.6 −2.1	5.64 +.32	26.7 −2.2	39.85 +.46	24.0 −2.2
14.7	26.40 .75	12.0 1.1	58.18 .33	44.6 2.1	5.98 .33	24.5 2.1	40.32 .48	22.0 1.7
24.7	27.16 .75	11.2 −0.5	58.51 .32	46.8 2.1	6.31 .33	22.5 2.0	40.80 .48	20.6 1.2
34.7	27.90 +.72	11.0 +0.1	58.83 +.31	48.9 −2.1	6.64 +.32	20.6 −1.7	41.29 +.47	19.6 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Virginis.		4 Draconis (H.)		γ Corvi.		β Chamæleontis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 11 59	° ′ +9 22	h m 12 6	° ′ +78 15	h m 12 9	° ′ −16 53	h m 12 11	° ′ −78 39
	s	″	s	″	s	″	s	″
(Dec. 30.7)	13.07 +.33	67.0 −2.0	40.20+1.18	52.6 −0.4	45.60 +.34	13.9 −2.2	30.34+1.24	11.2 −1.4
Jan. 9.7	13.39 .31	65.1 1.8	41.36 1.15	52.5 +0.2	45.93 .32	16.2 2.3	31.55 1.17	12.9 2.0
19.7	13.69 .29	63.4 1.5	42.48 1.08	53.0 0.8	46.24 .30	18.5 2.3	32.68 1.07	15.2 2.5
29.6	13.96 .26	62.0 1.3	43.51 .97	54.1 1.4	46.52 .27	20.8 2.3	33.69 .96	17.9 2.9
Feb. 8.6	14.20 .22	60.9 0.9	44.40 .82	55.8 2.0	46.77 .23	23.0 2.2	34.57 .80	21.0 3.3
18.6	14.40 +.18	60.1 −0.6	45.14 +.65	58.0 +2.4	46.98 +.19	25.0 −2.0	35.30 +.64	24.4 −3.5
28.5	14.55 .13	59.7 −0.3	45.70 .46	60.7 2.8	47.14 .14	26.9 1.8	35.85 .48	28.1 3.7
Mar. 10.5	14.66 .09	59.5 0.0	46.06 .25	63.6 3.0	47.26 .10	28.6 1.6	36.24 .30	31.9 3.8
20.5	14.73 .05	59.6 +0.2	46.21 +.05	66.6 3.1	47.35 .06	30.1 1.4	36.46 +.13	35.7 3.8
30.5	14.76 +.01	60.0 0.5	46.16 −.15	69.8 3.1	47.39 +.03	31.4 1.1	36.51 −.03	39.4 3.7
Apr. 9.4	14.76 −.02	60.5 +0.6	45.91 −.34	72.8 +2.9	47.40 .00	32.4 −0.9	36.40 −.19	43.1 −3.5
19.4	14.73 .05	61.2 0.7	45.48 .50	75.6 2.7	47.39 −.03	33.1 0.6	36.14 .33	46.5 3.3
29.4	14.67 .07	62.0 0.8	44.91 .65	78.2 2.4	47.34 .05	33.6 0.4	35.73 .47	49.6 3.0
May 9.4	14.60 .08	62.8 0.8	44.19 .77	80.3 2.0	47.28 .07	34.0 −0.2	35.20 .59	52.5 2.6
19.3	14.50 .10	63.7 0.8	43.38 .85	82.0 1.5	47.20 .09	34.1 0.0	34.55 .70	54.9 2.2
29.3	14.40 −.10	64.5 +0.8	42.49 −.91	83.2 +0.9	47.11 −.10	34.0 +0.2	33.80 −.79	56.9 −1.7
June 8.3	14.30 .11	65.3 0.8	41.56 .95	83.9 +0.4	47.00 .11	33.7 0.4	32.97 .86	58.4 1.2
18.3	14.19 .11	66.1 0.7	40.61 .95	84.0 −0.1	46.90 .11	33.2 0.5	32.08 .90	59.3 0.7
28.2	14.08 .11	66.7 0.6	39.67 .93	83.6 0.7	46.78 .11	32.6 0.7	31.16 .93	59.7 −0 1
July 8.2	13.98 .10	67.2 0.5	38.76 .89	82.6 1.3	46.67 .11	31.8 0.8	30.23 .92	59.6 +0.4
18.2	13.88 −.10	67.6 +0.3	37.90 −.82	81.1 −1.7	46.56 −.11	31.0 +0.9	29.32 −.89	58.9 +0.9
28.1	13.79 .08	67.9 +0.2	37.12 .74	79.2 2.2	46.46 .10	30.0 1.0	28.45 .83	57.7 1.5
Aug. 7.1	13.71 .07	68.0 0.0	36.43 .64	76.8 2.6	46.36 .09	28.9 1.1	27.66 .74	56.0 1.9
17.1	13.65 .05	68.0 −0.1	35.85 .52	73.9 3.0	46.29 .07	27.8 1.1	26.98 .62	53.8 2.3
27.1	13.61 −.03	67.8 0.3	35.39 .40	70.8 3.3	46.23 .04	26.7 1.0	26.43 .47	51.3 2.7
Sept. 6.0	13.59 .00	67.4 −0.5	35.06 −.26	67.4 −3.5	46.20 −.01	25.7 +0.9	26.04 −.30	48.5 +2.9
16.0	13.60 +.03	66.7 0.8	34.88 −.11	63.8 3.7	46.20 +.02	24.9 0.8	25.83 −.11	45.5 3.0
26.0	13.65 .06	65.8 1.0	34.85 +.05	60.1 3.7	46.24 .06	24.1 0.6	25.82 +.09	42.4 3.1
Oct. 6.0	13.73 .10	64.7 1.2	34.98 .21	56.3 3.8	46.31 .10	23.6 +0.3	26.02 .30	39.4 3.0
15.9	13.86 .14	63.4 1.5	35.27 .38	52.5 3.7	46.44 .15	23.4 0.0	26.43 .51	36.5 2.7
25.9	14.02 +.19	61.8 −1.7	35.73 +.54	48.9 −3 5	46.60 +.19	23.6 −0.3	27.04 +.71	33.9 +2.4
Nov. 4.9	14.23 .23	60.0 1.9	36.35 .70	45.4 3.3	46.81 .23	24.0 0.6	27.84 .88	31.7 2.0
14.8	14.47 .26	58.1 2.0	37.12 .84	42.3 3.0	47.06 .27	24.8 1.0	28.80 1.03	30.0 1.5
24.8	14.75 .29	56.0 2.1	38.03 .97	39.6 2.5	47.35 .30	26.0 1.3	29.90 1.16	28.8 0.9
Dec. 4.8	15.05 +.31	53.8 −2.2	39.06+1.07	37.2 −2.0	47.66 +.32	27.5 −1.6	31.09+1.22	28.2 +0.3
14.8	15.37 .33	51.6 2.2	40.16 1.14	35.5 1.5	47.99 .34	29.2 1.9	32.34 1.26	28.3 −0.4
24.7	15.70 .33	49.5 2.1	41.33 1.17	34.3 0.9	48.33 .33	31.2 2.1	33.60 1.25	29.0 1.0
34.7	16.03 +.32	47.5 −1.9	42.50+1.16	33.8 −0.2	48.66 +.31	33.4 −2.2	34.84+1.22	30.4 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Virginis.		α¹ Crucis.		β Corvi.		κ Draconis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	$12^{h}\ 13^{m}$	$-0^{\circ}\ 0'$	$12^{h}\ 20^{m}$	$-62^{\circ}\ 26'$	$12^{h}\ 28^{m}$	$-22^{\circ}\ 44'$	$12^{h}\ 28^{m}$	$+70^{\circ}\ 25'$
	s	"	s	"	s	"	s	"
(Dec. 30.7)	53.30 +.32	47.3 −2.1	3.73 +.59	30.7 −1.6	12.62 +.35	38.0 −2.1	26.73 +.75	53.9 −1.0
Jan. 9.7	53.62 .31	49.4 2.0	4.31 .57	32.6 2.2	12.96 .34	40.2 2.2	27.48 .74	53.2 −0.3
19.7	53.92 .29	51.3 1.9	4.86 .52	35.0 2.6	13.29 .32	42.5 2.3	28.21 .71	53.2 +0.3
29.7	54.20 .26	53.1 1.7	5.36 .47	37.8 2.9	13.59 .29	44.8 2.4	28.89 .65	53.9 1.0
Feb. 8.6	54.45 .23	54.6 1.4	5.79 .40	40.9 3.2	13.86 .25	47.2 2.3	29.50 .57	55.1 1.5
18.6	54.65 +.19	55.9 −1.1	6.16 +.33	44.2 −3.4	14.09 +.21	49.4 −2.2	30.02 +.47	57.0 +2.0
28.6	54.82 .15	56.9 0.9	6.45 .26	47.7 3.5	14.28 .17	51.6 2.1	30.43 .36	59.2 2.5
Mar. 10.5	54.95 .11	57.6 0.6	6.67 .18	51.2 3.5	14.43 .13	53.6 1.9	30.73 .24	61.9 2.8
20.5	55.03 .07	58.1 0.3	6.81 .11	54.7 3.5	14.53 .09	55.4 1.7	30.90 +.11	64.8 3.0
30.5	55.08 +.03	58.3 −0.1	6.88 +.04	58.1 3.3	14.60 .05	56.9 1.5	30.95 −.01	67.8 3.0
Apr. 9.5	55.09 .00	58.3 +0.1	6.89 −.03	61.3 −3.1	14.63 +.02	58.3 −1.2	30.89 −.12	70.8 +3.0
19.4	55.08 −.03	58.1 0.3	6.83 .09	64.3 2.9	14.63 −.01	59.4 1.0	30.71 .23	73.7 2.8
29.4	55.03 .05	57.8 0.4	6.71 .15	67.0 2.5	14.60 .04	60.2 0.8	30.43 .32	76.4 2.6
May 9.4	54.98 .07	57.3 0.5	6.54 .19	69.4 2.2	14.55 .06	60.9 0.5	30.08 .39	78.8 2.2
19.4	54.90 .08	56.8 0.6	6.32 .24	71.4 1.8	14.48 .08	61.3 −0.3	29.65 .46	80.9 1.8
29.3	54.81 −.09	56.1 +0.6	6.06 −.27	73.0 −1.4	14.40 −.09	61.4 0.0	29.17 −.50	82.4 +1.3
June 8.3	54.72 .10	55.5 0.7	5.78 .30	74.1 0.9	14.30 .10	61.4 +0.2	28.65 .53	83.5 0.8
18.3	54.62 .10	54.8 0.7	5.46 .32	74.7 −0.4	14.19 .11	61.1 0.4	28.12 .54	84.1 +0.3
28.2	54.51 .10	54.1 0.7	5.13 .34	74.9 +0.1	14.07 .12	60.6 0.6	27.58 .54	84.1 −0.2
July 8.2	54.41 .10	53.4 0.6	4.79 .34	74.6 0.6	13.95 .12	60.0 0.8	27.04 .53	83.6 0.8
18.2	54.31 −.10	52.8 +0.6	4.46 −.33	73.8 +1.1	13.83 −.12	59.1 +0.9	26.53 −.50	82.6 −1.3
28.2	54.21 .09	52.2 0.5	4.14 .31	72.5 1.5	13.71 .12	58.1 1.1	26.05 .46	81.0 1.8
Aug. 7.1	54.12 .08	51.7 0.5	3.84 .28	70.8 1.9	13.60 .10	56.9 1.2	25.61 .41	79.1 2.2
17.1	54.05 .06	51.3 0.3	3.58 .23	68.7 2.2	13.50 .09	55.7 1.2	25.23 .35	76.6 2.6
27.1	54.00 .04	51.1 +0.2	3.37 .18	66.3 2.5	13.43 .06	54.4 1.3	24.92 .28	73.9 2.9
Sept. 6.1	53.97 −.02	51.0 0.0	3.23 −.11	63.7 +2.7	13.38 −.04	53.2 +1.2	24.68 −.20	70.8 −3.2
16.0	53.97 +.02	51.1 −0.2	3.15 −.03	61.0 2.7	13.36 .00	52.0 1.1	24.52 .12	67.4 3.5
26.0	54.00 .05	51.4 0.4	3.16 +.05	58.2 2.7	13.37 +.04	51.0 0.9	24.45 −.02	63.9 3.6
Oct. 6.0	54.07 .09	51.9 0.7	3.26 .14	55.6 2.6	13.43 .08	50.1 0.7	24.47 +.08	60.2 3.7
15.9	54.18 .13	52.7 0.9	3.44 .23	53.1 2.3	13.54 .13	49.6 0.4	24.61 .18	56.4 3.7
25.9	54.33 +.18	53.8 −1.2	3.72 +.32	50.9 +2.0	13.69 +.18	49.3 +0.1	24.84 +.29	52.8 −3.6
Nov. 4.9	54.53 .22	55.1 1.5	4.08 .40	49.2 1.5	13.89 .29	49.4 −0.3	25.18 .39	49.2 3.5
14.9	54.76 .25	56.7 1.7	4.52 .47	47.9 1.0	14.14 .26	49.8 0.6	25.63 .49	45.8 3.2
24.8	55.03 .29	58.5 1.9	5.03 .53	47.1 +0.5	14.42 .30	50.6 1.0	26.17 .58	42.7 2.9
Dec. 4.8	55.33 +.31	60.4 −2.0	5.59 +.57	46.9 −0.1	14.74 +.33	51.8 −1.4	26.79 +.65	40.1 −2.4
14.8	55.65 .32	62.5 2.1	6.17 .59	47.4 0.7	15.07 .34	53.4 1.7	27.47 .71	37.9 1.9
24.8	55.97 .33	64.6 2.1	6.77 .60	48.4 1.3	15.42 .35	55.2 1.9	28.20 .74	36.2 1.3
34.7	56.30 +.32	66.7 −2.1	7.36 +.58	49.9 −1.8	15.77 +.34	57.2 −2.2	28.95 +.75	35.2 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32^3 Camelop. (H.)		α^2 Can. Venaticorum.		θ Virginis.		α Virginis. (*Spica.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 12 48	+84° 2′	h m 12 50	+38° 56′	h m 13 3	−4° 54′	h m 13 18	−10° 32′
	s	″	s	″	s	′	s	″
(Dec. 30.8)	13.33+2.15	49.5 −0.8	31.05 +.38	61.6 −1.8	51.32 +.33	36.3 −2.0	59.47 +.33	44.7 −2.0
Jan. 9.7	15.50 2.17	49.0 −0.2	31.43 .38	60.0 1.4	51.65 .33	38.3 2.0	59.80 .33	46.6 2.0
19.7	17.65 2.12	49.1 +0.4	31.81 .37	58.9 0.9	51.98 .31	40.3 1.9	60.13 .32	48.6 2.0
29.7	19.71 1.98	49.8 1.1	32.16 .34	58.3 −0.3	52.28 .29	42.2 1.8	60.44 .30	50.6 1.9
Feb. 8.6	21.59 1.77	51.2 1.7	32.48 .30	58.2 +0.2	52 55 .26	43.9 1.6	60.73 .27	52.4 1.7
18.6	23.24+1.50	53.2 +2.2	32.76 +.26	58.7 +0.7	52.80 +.23	45.4 −1.4	60 99 +.24	54.1 −1.6
28.6	24.57 1.17	55.6 2.6	33.00 .21	59.6 1.2	53.01 .19	46.6 1.1	61.22 .21	55.5 1.4
Mar. 10.6	25.56 .80	58.4 2.9	33.18 .16	61.0 1.6	53.18 .15	47.6 0.8	61.40 .17	56.8 1 1
20.5	26.17 .41	61.4 3.1	33.32 .11	62.7 1.8	53.32 .12	48.3 0.6	61.56 .13	57.8 0.9
30.5	26.38 +.02	64.6 3.2	33.40 .06	64.7 2.1	53.42 .08	48.8 0.3	61.67 .10	58.6 0.7
Apr. 9.5	26.20 −.37	67.7 +3.1	33.44 +.01	66.8 +2.2	53.48 +.05	49.0 −0.1	61.76 +.07	59.1 −0.5
19.5	25.65 .73	70 8 2.9	33.43 −.03	69.0 2.2	53.52 +.02	49.1 0.0	61.81 .04	59.5 0.3
29.4	24.75 1.06	73.6 2.7	33.38 .06	71.3 2.2	53.53 −.01	48.9 +0 2	61.83 +.01	59.6 −0.1
May 9.4	23.53 1.35	76.1 2.3	33.30 .10	73.4 2.0	53.51 .03	48.6 0.3	61.83 −.01	59.7 +0.1
19.4	22.05 1.59	78.2 1.9	33.19 .12	75.3 1.8	53.47 .05	48.2 0.4	61.80 .04	59.5 0.2
29.3	20.36−1.77	79.8 +1.4	33.06 −.14	77.1 +1.6	53.41 −.07	47 7 +0.5	61.76 −.06	59.3 +0.3
June 8.3	18.52 1.90	80.9 0.8	32.91 .16	78.5 1.3	53.34 .08	47.2 0.6	61.69 .07	58.9 0.4
18.3	16.57 1.98	81.4 +0.3	32.74 .17	79.6 0.9	53.25 .09	46.6 0.6	61.61 .09	58.4 0.5
28.3	14.58 2.00	81.4 −0.3	32.57 .17	80.3 0.6	53.16 .10	45.9 0.7	61.52 .10	57.9 0.6
July 8.2	12.58 1.98	80.9 0.8	32.40 .18	80.7 +0.2	53.05 .11	45.2 0.7	61.41 .11	57.3 0.6
18.2	10.64−1.90	79.8 −1.4	32.22 −.17	80.7 −0.2	52.94 −.11	44.6 +0.7	61.30 −.12	56.6 +0.7
28.2	8.78 1.79	78.2 1.8	32.05 .17	80.3 0.6	52.82 .11	43.9 0.6	61.18 .12	55.9 0.7
Aug. 7.2	7.07 1.63	76.1 2.3	31.89 .15	79.6 1.0	52.71 .11	43.3 0.6	61.06 .12	55.2 0.7
17.1	5.53 1.44	73.6 2.7	31.75 .14	78.4 1.3	52.60 .10	42.8 0.5	60.94 .11	54.5 0.7
27.1	4.20 1.22	70.6 3.1	31.62 .11	76.9 1.6	52.51 .08	42.3 0.4	60.84 .09	53.8 0.6
Sept. 6.1	3.10 −.97	67.4 −3.4	31.52 −.08	75.1 −2.0	52.44 −.06	41.9 +0.3	60.75 −.07	53.3 +0.5
16.0	2.26 .70	63.9 3.6	31.46 .05	73.0 2.3	52.39 −.03	41.8 +0.1	60.69 .05	52.8 0.4
26.0	1.71 .40	60.2 3.7	31.43 −.01	70.6 2.5	52.37 .00	41.7 −0.1	60 66 −.01	52.4 +0.2
Oct. 6.0	1.47 −.08	56.4 3.8	31.45 +.04	67.9 2.7	52.40 +.04	42.0 0.3	60.66 +.03	52.3 0.0
16.0	1.54 +.25	52.6 3.8	31.51 .09	65.1 2.9	52.46 .08	42.4 0.6	60.71 .07	52.4 −0.2
25.9	1.96 +.58	48.9 −3.7	31.63 +.14	62.1 −3.0	52.56 +.13	43.1 −0.8	60.81 +.12	52.7 −0.5
Nov. 4.9	2.70 .90	45.2 3.5	31.80 .19	59.0 3.1	52.72 .17	44.1 1.1	60.95 .17	53.4 0.8
14.9	3.76 1.22	41.8 3.2	32.02 .24	55.9 3.1	52.91 .22	45.3 1.4	61.14 .21	54.2 1.0
24.9	5.13 1.51	38.7 2.9	32.29 .29	52.9 2.9	53.15 .26	46.8 1.6	61.37 .25	55.4 1.3
Dec. 4.8	6.77+1.76	36.1 −2.4	32.60 +.33	50.0 −2.7	53.42 +.29	48.5 −1.8	61.64 +.28	56.9 −1.5
14.8	8.64 1.96	33.9 1.9	32.94 .36	47.4 2.5	53.73 .31	50.4 1.9	61.94 .31	58.5 1.7
24.8	10.68 2.10	32.3 1.3	33.32 .38	45.1 2.1	54.05 .32	52.4 2.0	62.26 .32	60.3 1.9
34.7	12.83+2.18	31.4 −0.6	33.70 +.38	43.2 −1.7	54.37 +.33	54.4 −2.0	62.59 +.33	62.3 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Virginis.		η Ursæ Majoris.		η Bootis.		β Centauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 13 28	+0° 0′	h m 13 42	+49° 53′	h m 13 49	+18° 58′	h m 13 55	−59° 47′
	s	″	s	″	s	″	s	″
(Dec. 30.8)	41.56 +.33	22.3 −2.1	53.34 +.41	49.1 −2.2	4.40 +.33	71.4 −2.3	31.12 +.57	58.4 −0.4
Jan. 9.8	41.88 .32	20.2 2.0	53.76 .43	47.2 1.7	4.73 .33	69.3 2.0	31.70 .57	59.1 0.9
19.7	42.20 .32	18.3 1.9	54.19 .43	45.8 1.1	5.06 .33	67 4 1.7	32.28 .57	60.3 1.4
29.7	42.51 .30	16.6 1.6	54.61 .41	45.0 −0.5	5.38 .32	65.9 1.3	32.83 .55	61.9 1.8
Feb. 8.7	42.80 .27	15.0 1.4	55.02 .39	44.8 +0.1	5.69 .29	64.8 0.9	33.36 .51	63.9 2.2
18.7	43.06 +.24	13.8 −1.1	55.38 +.35	45.2 +0.7	5.97 +.26	64.2 −0.4	33.85 +.47	66.2 −2.5
28.6	43.29 .21	12.8 0.8	55.71 .30	46.3 1.3	6.22 .23	64.0 0.0	34.30 .42	68.8 2.7
Mar. 10.6	43.48 .18	12.1 0.6	55.99 .25	47.8 1.8	6.43 .20	64.2 +0.4	34 69 .36	71.6 2.8
20.6	43.64 .14	11.6 −0.3	56.20 .19	49.8 2.2	6.61 .16	64.8 0.7	35.02 .30	74.5 2.9
30.5	43.76 .11	11.5 0.0	56.37 .13	52.1 2.5	6.75 .12	65.6 1.0	35.29 .24	77.5 3.0
Apr. 9.5	43.85 +.07	11.6 +0.2	56.47 +.08	54.7 +2.7	6.86 +.09	66.8 +1.3	35.50 +.18	80.4 −2.9
19.5	43.91 .04	11.9 0.4	56.52 +.02	57.4 2.7	6.93 .05	68.2 1.5	35.65 .12	83.4 2.8
29.5	43.94 +.02	12.4 0.5	56.51 −.03	60.2 2.7	6.96 +.02	69.8 1.6	35.74 +.06	86.1 2.7
May 9.4	43.94 −.01	12.9 0.6	56.46 .08	62.9 2.6	6.97 −.01	71.4 1.6	35.78 .00	88.8 2.5
19.4	43.92 .03	13.6 0.7	56.36 .12	65.4 2.4	6.95 .03	73.0 1.6	35.75 −.05	91.2 2.3
29.4	43.88 −.05	14.4 +0.8	56.22 −.15	67.7 +2.1	6.91 −.06	74.6 +1.5	35.67 −.11	93.3 −2.0
June 8.4	43.82 .07	15.1 0.8	56.05 .18	69.7 1.8	6.84 .08	76.0 1.4	35.54 .16	95.1 1.6
18.3	43.74 .09	15.9 0.8	55.85 .21	71.4 1.4	6.75 .10	77.3 1.2	35.36 .20	96.6 1.3
28.3	43.64 .10	16.7 0.7	55.63 .23	72.6 1.0	6.65 .11	78.4 1.0	35.13 .24	97.6 0.9
July 8.3	43.54 .11	17.4 0.7	55.39 .24	73.4 0.6	6.53 .13	79.3 0.8	34.87 .28	98.3 −0.4
18.2	43.42 −.12	18.0 +0.6	55.15 −.25	73.7 +0.1	6.40 −.14	80.0 +0.5	34.58 −.30	98.5 0.0
28.2	43.30 .12	18.6 0.5	54.89 .25	73.6 −0.4	6.26 .14	80.4 +0.3	34.27 .31	98.3 +0.5
Aug. 7.2	43.18 .12	19.1 0.5	54.64 .25	73.0 0.8	6.12 .14	80.6 0.0	33.95 .32	97.6 0.9
17.2	43.06 .11	19.5 0.3	54.40 .23	71.9 1.3	5.98 .14	80.5 −0.2	33.64 .30	96.5 1.3
27.1	42.96 .10	19.8 +0.2	54.18 .21	70.4 1.7	5.84 .13	80.1 0.5	33.35 .28	95.0 1.7
Sept. 6.1	42.86 −.08	19.9 0.0	53.98 −.19	68.5 −2.1	5.72 −.11	79.4 −0.8	33.08 −.24	93.1 +2.0
16.1	42.79 .06	19.8 −0.2	53.81 .15	66.2 2.4	5.62 .09	78.4 1.1	32.87 .19	91.0 2.2
26.1	42.75 −.02	19.6 0.4	53.68 .10	63.6 2.8	5.55 .05	77.2 1.4	32.71 .12	88.6 2.4
Oct. 6.0	42.75 +.01	19.1 0.6	53.60 −.05	60.7 3.1	5.52 −.02	75.7 1.7	32.63 −.04	86.2 2.5
16.0	42.78 .06	18.4 0.8	53.58 +.01	57.5 3.3	5.52 +.03	73.9 1.9	32.63 +.04	83.7 2.5
26.0	42.86 +.10	17.4 −1.1	53.61 +.07	54.2 −3.4	5.57 +.07	71.8 −2.1	32.72 +.13	81.3 +2.3
Nov. 4.9	42.99 .15	16.2 1.3	53.71 .13	50.7 3.5	5.67 .12	69.6 2.3	32.90 .22	79.0 2.1
14.9	43.16 .19	14.8 1.6	53.88 .20	47.2 3.5	5.82 .17	67.2 2.5	33.17 .31	77.1 1.8
24.9	43.37 .23	13.1 1.8	54.11 .26	43.7 3.4	6.01 .22	64.6 2.6	33.52 .39	75.5 1.4
Dec. 4.9	43.63 +.27	11.2 −1.9	54.40 +.32	40.4 −3.2	6.25 +.26	62.0 −2.6	33.94 +.46	74.4 +0.9
14.8	43.91 .30	9.2 2.0	54.74 .36	37.4 2.9	6.52 .29	59.5 2.5	34.43 .51	73.7 +0.4
24.8	44.22 .32	7.2 2.1	55.12 .40	34.7 2.5	6.83 .31	57.0 2.4	34.96 .55	73.5 −0.1
34.8	44.54 +.32	5.1 −2.0	55.53 +.42	32.5 −2.0	7.15 +.32	54.7 −2.1	35.52 +.56	73.9 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Draconis.		α Bootis. (*Arcturus.*)		θ Bootis.		ρ Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 14 1	° ′ +64 55	h m 14 10	° ′ +19 47	h m 14 21	° ′ +52 23	h m 14 26	° ′ +30 52
	s	″	s	″	s	″	s	″
(Dec. 30.8)	10.63 +.55	62.7 -2.2	17.05 +.32	39.2 -2 4	10.25 +.40	29.2 -2.5	44.72 +.32	70.4 -2.6
Jan. 9.8	11.20 .58	60.7 1.6	17.37 .32	36.9 2.1	10.67 .43	26.9 2.0	45.05 .34	68.0 2.2
19.8	11.79 .59	59.4 1.0	17.70 .33	34.9 1.8	11.10 .44	25.2 1.5	45.39 .35	66.1 1.7
29.7	12.38 .58	58.8 -0.3	18.02 .32	33.3 1.4	11.54 .44	24.0 0.8	45.74 .34	64.5 1.3
Feb. 8.7	12.96 .56	58.8 +0.3	18.33 .30	32.1 1.0	11.97 .42	23.5 -0.2	46.07 .33	63.5 0.7
18.7	13.50 +.51	59.5 +1.0	18.62 +.27	31.4 -0.5	12.38 +.39	23.6 +0.4	46.39 +.30	63.1 -0.2
28.7	13.98 .45	60.8 1.6	18.88 .25	31.1 -0.1	12.75 .35	24.4 1.0	46.68 .27	63.1 +0.3
Mar. 10.6	14.39 .38	62.6 2.1	19.11 .21	31.2 +0.3	13.08 .30	25.7 1.6	46.94 .24	63.7 0.8
20.6	14.73 .29	64.9 2.5	19.31 .18	31.8 0.7	13.36 .25	27.5 2.0	47.16 .20	64.7 1.2
30.6	14.98 .21	67.6 2.8	19.46 .14	32.6 1.0	13.58 .19	29.8 2.4	47.34 .16	66.2 1.6
Apr. 9.5	15.14 +.12	70.6 +3 0	19.59 +.11	33.8 +1.3	13.74 +.13	32.4 +2.7	47.49 +.13	67.9 +1.9
19.5	15.22 +.03	73.6 3.1	19.68 .07	35.2 1.5	13.84 .08	35.2 2.9	47.60 .09	69.9 2.1
29.5	15.20 -.06	76.8 3.1	19.74 .04	36.8 1.6	13.89 +.02	38.1 2.9	47.67 .05	72.2 2.2
May 9.5	15.10 .14	79.8 2.9	19.76 +.01	38.5 1.7	13.88 -.03	41.0 2.9	47.70 +.02	74.4 2.3
19.4	14.93 .21	82.6 2.7	19.76 -.02	40.2 1.7	13.82 .08	43.8 2.7	47.70 -.02	76.7 2 2
29.4	14.69 -.27	85.2 +2.4	19.73 -.04	41.8 +1.6	13.71 -.13	46.4 +2.5	47.67 -.05	78.8 +2.1
June 8.4	14.39 .32	87.4 2.0	19.67 .07	43.4 1.5	13.56 .17	48.8 2.2	47.60 .08	80.9 1.9
18.4	14.05 .37	89.2 1.6	19.59 .09	44.7 1.3	13.37 .21	50.8 1.8	47.51 .10	82.7 1.7
28.3	13.66 .40	90.5 1.1	19.49 .11	46.0 1.1	13.15 .24	52.4 1.4	47.40 .13	84.2 1.4
July 8.3	13.24 .42	91.4 0.6	19.37 .13	46.9 0.9	12.90 .26	53.6 1.0	47.26 .15	85.5 1.1
18.3	12.81 -.44	91.7 +0.1	19.24 -.14	47.7 +0.6	12.63 -.28	54.4 +0.5	47.11 -.16	86.4 +0.8
28.2	12.37 .44	91.5 -0.5	19.09 .15	48.2 0.3	12.35 .29	54.6 0.0	46.94 .17	87.0 +0.4
Aug. 7.2	11.92 .44	90.8 1.0	18.94 .15	48.4 +0.1	12.06 .29	54.4 -0.5	46.76 .18	87.2 0.0
17.2	11.50 .42	89.6 1.5	18.79 .15	48.3 -0.2	11.77 .28	53.7 0.9	46.58 .18	87.1 -0.3
27.2	11.09 .39	87.8 1.9	18.64 .14	48.0 0.5	11.49 .27	52.5 1.4	46.40 .17	86.5 0.7
Sept. 6.1	10.72 -.35	85.7 -2.4	18.50 - 13	47.3 -0.8	11 23 -.25	50.9 -1.8	46.23 -.16	85.6 -1.1
16.1	10.39 .30	83.1 2.8	18.38 .11	46.3 1.1	11.00 .22	48.8 2.3	46.08 .14	84.4 1.4
26.1	10.13 .23	80.2 3.1	18.29 .08	45.1 1.4	10.80 .17	46.4 2.6	45.95 .11	82.7 1.8
Oct. 6.1	9.93 .16	76.9 3.4	18.23 -.04	43.5 1.7	10.65 .12	43.6 2.9	45.86 .07	80.8 2.1
16.0	9.81 -.08	73.5 3.6	18.21 .00	41.7 2.0	10.56 -.07	40.5 3.2	45.81 -.03	78.5 2.4
26.0	9.78 +.01	69.8 -3.7	18.23 +.05	39.6 -2.2	10.52 .00	37.2 -3.4	45.81 + 02	76.0 -2.6
Nov. 5.0	9.84 .11	66.0 3.8	18.31 .10	37.3 2.4	10.56 +.07	33.7 3.6	45.86 .08	73.3 2.8
14.9	9.99 .20	62.3 3.7	18.43 .15	34.8 2.6	10.66 .14	30.1 3.6	45.96 .13	70.4 3.0
24.9	10.24 .29	58.6 3.6	18.60 .19	32.2 2.7	10.83 .21	26.5 3.6	46.12 .18	67.4 3.0
Dec. 4.9	10.58 +.38	55.1 -3.3	18.82 +.24	29.5 -2.7	11.08 +.27	23.0 -3.4	46.32 +.23	64.3 -3.0
14.9	11.00 .46	52.0 3.0	19.08 .27	26.9 2.6	11.38 .33	19.7 3.2	46.58 .27	61.4 2.9
24.8	11.49 .52	49.2 2.5	19.36 .30	24.3 2.5	11.74 .38	16.7 2.8	46.86 .30	58.6 2.7
34.8	12.04 +.56	47.0 -2.0	19.67 +.32	21.9 -2.3	12.13 +.41	14.1 -2.3	47.18 +.33	56.0 -2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	5 Ursæ Minoris.		α^2 Centauri.		ε Bootis.		α^2 Libræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 14 27	° ′ +76 12	h m 14 31	° ′ -60 20	h m 14 39	° ′ +27 33	h m 14 44	° ′ -15 33
	s	″	s	″	s	″	s	″
(Dec. 30.8)	43.76 +.83	53.2 −2.3	37.23 +.55	47.4 +0.1	50.04 +.31	68.4 −2.6	21.49 +.32	1.1 −1.4
Jan. 9.8	44.64 .91	51.2 1.7	37.79 .57	47.6 −0.4	50.37 .33	66.0 2.2	21.82 .33	2.6 1.5
19.8	45.58 .96	49.8 1.1	38.37 .57	48.2 0.9	50.70 .34	64.0 1.8	22.15 .33	4.2 1.6
29.7	46.55 .97	49.0 −0.4	38.94 .56	49.3 1.3	51.04 .33	62.4 1.4	22.48 .33	5.8 1.6
Feb. 8.7	47.52 .95	48.9 +0.3	39.49 .54	50.8 1.7	51.37 .32	61.2 0.9	22.80 .32	7.4 1.5
18.7	48.45 +.90	49.5 +0.9	40.02 +.51	52.6 −2.0	51.68 +.30	60.6 −0.4	23.11 +.30	8.8 −1.4
28.7	49.31 .81	50.8 1.5	40.50 .46	54.8 2.3	51.97 .28	60.5 +0.1	23.40 .27	10.2 1.3
Mar. 10.6	50.07 .70	52.6 2.1	40.94 .41	57.2 2.5	52.23 .25	60.9 0.6	23.66 .25	11.3 1.1
20.6	50.71 .56	54.9 2.5	41.33 .36	59.8 2.6	52.46 .21	61.7 1.0	23.89 .22	12.4 0.9
30.6	51.20 .41	57.6 2.9	41.66 .30	62.5 2.7	52.65 .18	63.0 1.4	24.09 .19	13.2 0.7
Apr. 9.6	51.53 +.26	60.6 +3.1	41.94 +.25	65.2 −2.8	52.81 +.14	64.6 +1.8	24.26 +.16	13.8 −0.6
19.5	51.71 +.10	63.8 3.2	42.15 .19	68.0 2.8	52.93 .10	66.4 2.0	24.40 .13	14.3 0.4
29.5	51.72 −.07	67.0 3.2	42.31 .12	70.7 2.7	53.02 .07	68.5 2.1	24.52 .10	14.6 0.2
May 9.5	51.58 .22	70.2 3.1	42.40 +.06	73.3 2.5	53.07 +.03	70.6 2.2	24.60 .07	14.8 −0.1
19.4	51.28 .36	73.2 2.9	42.43 .00	75.8 2.4	53.08 .00	72.8 2.2	24.65 .04	14.8 0.0
29.4	50.86 −.49	76.0 +2.6	42.40 −.06	78.0 −2.2	53.07 −.03	75.0 +2.1	24.68 +.01	14.8 +0.1
June 8.4	50.30 .60	78.4 2.2	42.32 .12	80.1 1.9	53.02 .06	77.0 1.9	24.68 −.02	14.6 0.2
18.4	49.65 .70	80.3 1.8	42.17 .17	81.8 1.5	52.95 .09	78.8 1.7	24.65 .04	14.4 0.3
28.3	48.91 .77	81.9 1.3	41.97 .22	83.2 1.2	52.85 .11	80.4 1.4	24.59 .07	14.1 0.3
July 8.3	48.11 .83	82.9 0.8	41.72 .27	84.2 0.8	52.73 .13	81.7 1.2	24.51 .09	13.7 0.4
18.3	47.26 −.87	83.4 +0.2	41.44 −.30	84.8 −0.4	52.58 −.15	82.7 +0.9	24.40 −.11	13.2 +0.5
28.3	46.38 .88	83.4 −0.3	41.12 .33	84.9 +0.1	52.43 .17	83.4 0.5	24.28 .13	12.8 0.5
Aug. 7.2	45.50 .88	82.8 0.8	40.78 .34	84.6 0.5	52.25 .18	83.8 +0.2	24.14 .14	12.2 0.6
17.2	44.62 .86	81.7 1.3	40.44 .34	83.9 0.9	52.08 .18	83.8 −0.2	24.00 .15	11.6 0.6
27.2	43.78 .82	80.1 1.8	40.10 .33	82.8 1.3	51.90 .17	83.4 0.5	23.85 .15	11.0 0.6
Sept. 6.1	42.90 −.75	78.0 −2.3	39.78 −.30	81.2 +1.7	51.73 −.16	82.7 −0.9	23.70 −.14	10.4 +0.6
16.1	42.29 .66	75.5 2.7	39.50 .25	79.4 2.0	51.58 .14	81.6 1.2	23.58 .12	9.8 0.5
26.1	41.67 .56	72.6 3.0	39.27 .19	77.2 2.3	51.45 .11	80.2 1.5	23.47 .09	9.3 0.5
Oct. 6.1	41.16 .44	69.4 3.3	39.11 .12	74.9 2.4	51.35 .08	78.6 1.8	23.39 .06	8.9 0.4
16.0	40.78 .31	66.0 3.6	39.03 −.04	72.4 2.4	51.29 −.04	76.5 2.1	23.36 −.01	8.6 +0.2
26.0	40.55 −.16	62.3 −3.8	39.04 +.05	70.0 +2.4	51.28 +.01	74.2 −2.4	23.37 +.04	8.6 0.0
Nov. 5.0	40.47 .00	58.5 3.8	39.14 .15	67.6 2.3	51.31 .06	71.6 2.7	23.43 .09	8.7 −0.2
15.0	40.56 +.17	54.7 3.8	39.33 .24	65.4 2.0	51.40 .12	68.9 2.8	23.54 .14	9.0 0.5
24.9	40.81 .33	51.0 3.7	39.62 .33	63.6 1.7	51.54 .17	66.0 2.9	23.70 .19	9.6 0.7
Dec. 4.9	41.22 +.49	47.4 −3.4	39.98 +.40	62.0 +1.3	51.73 +.22	63.0 −2.9	23.91 +.23	10.4 −0.9
14.9	41.79 .64	44.2 3.0	40.42 .47	61.0 0.9	51.97 .26	60.2 2.8	24.16 .27	11.5 1.2
24.8	42.50 .76	41.3 2.6	40.92 .52	60.3 +0.4	52.25 .29	57.4 2.7	24.44 .30	12.8 1.3
34.8	43.31 +.87	39.0 −2.1	41.46 +.55	60.2 −0.1	52.55 +.31	54.8 −2.4	24.76 +.32	14.2 −1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris.		β Bootis.		β Libræ.		μ¹ Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 14 50	° ′ +74 37	h m 14 57	° ′ +40 50	h m 15 10	° ′ −8 56	h m 15 20	° ′ +37 47
	s	″	s	″	s	″	s	″
(Dec. 30.8)	60.08 +.71	56.9 −2.6	29.64 +.32	69.7 −2.8	39.72 +.29	48.2 −1.5	1.48 +.30	18.3 −2.8
Jan. 9.8	60.83 .79	54.6 2.0	29.98 .35	67.1 2.4	40.02 .31	49.8 1.6	1.80 .33	15.6 2.5
19.8	61.66 .85	52.9 1.4	30.34 .36	65.0 1.9	40.34 .32	51.4 1.6	2.13 .35	13.3 2.1
29.8	62.52 .88	51.8 0.8	30.71 .37	63.3 1 4	40.66 .32	52.9 1.5	2.48 .36	11.5 1.6
Feb. 8.7	63.40 .88	51.3 −0.1	31.08 .36	62.2 0.8	40.97 .31	54.3 1.4	2.84 .35	10.2 1.0
18.7	64.27 +.84	51.6 +0.6	31.43 +.35	61.8 −0.2	41.28 +.30	55.6 −1.2	3.19 +.34	9 5 −0.4
28.7	65.08 .78	52.5 1.2	31.77 .32	61.9 +0.4	41.57 .28	56.7 1.0	3.52 .32	9.4 +0.2
Mar. 10.7	65.81 .69	54.1 1.8	32.08 .29	62.6 1.0	41.84 .26	57.6 0.8	3.83 .29	9.8 0.7
20.6	66.45 .58	56.2 2.3	32.35 .25	63.8 1.5	42.08 .23	58.2 0.5	4.11 .26	10.8 1.3
30.6	66.97 .45	58.7 2.7	32.58 .21	65.5 1.9	42.30 .20	58.7 0.3	4.35 .23	12.3 1.7
Apr. 9.6	67.35 +.31	61.6 +3.0	32.76 +.17	67.6 +2.3	42.49 +.18	58.9 −0.1	4.56 +.19	14.2 +2.1
19.5	67.59 .17	64.7 3.2	32.91 .12	70.0 2.5	42.65 .15	58.9 +0.1	4.73 .15	16.5 2.4
29.5	67.69 +.03	68.0 3.3	33.01 .08	72.6 2.7	42.78 .12	58.8 0.2	4.86 .11	19.0 2.6
May 9.5	67.65 −.11	71.2 3.2	33.07 +.04	75.3 2.7	42.89 .09	58.5 0.3	4.94 .07	21.6 2.7
19.5	67.47 .25	74.3 3.1	33.08 .00	78.0 2.7	42.97 .06	58.1 0.4	4.99 +.03	24.3 2.7
29.4	67.16 −.37	77.3 +2.8	33.06 −.04	80.7 +2.6	43.02 +.03	57.6 +0.5	5.00 −.01	27.0 +2.6
June 8.4	66.73 .48	79.9 2.4	33.00 .08	83.1 2.3	43.03 .00	57.1 0.5	4.96 .05	29.5 2.4
18.4	66.20 .58	82.2 2.1	32.90 .11	85.4 2.1	43.02 −.03	56.5 0.6	4.90 .09	31.9 2.2
28.4	65.58 .66	84.0 1.6	32.77 .15	87.3 1.8	42.98 .05	55.9 0.6	4.79 .12	33.9 1.9
July 8.3	64.90 .72	85.4 1.1	32.61 .17	88.9 1.4	42.91 .08	55.4 0.6	4.66 .15	35.7 1.6
18.3	64.15 −.77	86.2 +0.6	32.42 −.20	90.1 +1.0	42.82 −.11	54.8 +0.6	4.49 −.18	37.1 +1.2
28.3	63.37 .80	86.5 +0.1	32.22 .21	90.9 0.6	42.70 .13	54.2 0.6	4.30 .20	38.2 0.8
Aug. 7.2	62.56 .81	86.3 −0.5	31.99 .23	91.3 +0.2	42.57 .14	53.7 0.5	4.10 .21	38.8 +0.4
17.2	61.76 .80	85.6 1.0	31.76 .23	91.2 −0.3	42.42 .15	53.2 0.5	3.87 .22	39.0 0.0
27.2	60.97 .77	84.4 1.5	31.53 .23	90.7 0.7	42.27 .15	52.7 0.4	3.65 .23	38.8 −0.4
Sept. 6.2	60.22 −.73	82.6 −2.0	31.31 −.22	89.8 −1.2	42.12 −.15	52.3 +0.4	3.42 −.22	38.2 −0.9
16.1	59.52 .66	80.4 2.4	31.10 .20	88.4 1.6	41.98 .13	52.0 0.3	3.21 .20	37.1 1.3
26.1	58.90 .58	77.8 2.8	30.92 .17	86.7 2.0	41.86 .11	51.8 +0.1	3.02 .18	35.6 1.7
Oct. 6 1	58.37 .48	74.8 3.1	30.77 .13	84.5 2.3	41.76 .08	51.7 0.0	2.85 .15	33.8 2.0
16.1	57.95 .36	71.5 3.4	30.66 .08	82.0 2.7	41.70 −.04	51.8 −0.2	2.73 .10	31.5 2.4
26.0	57.66 −.23	68.0 −3.6	30.60 −.03	79.2 −2.9	41.69 +.01	52.1 −0.4	2.65 −.05	29.0 −2.7
Nov. 5.0	57.50 −.08	64.3 3.8	30.60 +.03	76.1 3.1	41.72 .05	52.5 0.6	2.62 ,00	26.1 3.0
15.0	57.50 +.07	60.5 3.8	30.66 .09	72.9 3.3	41.80 .11	53.2 0.8	2.66 +.06	23.1 3.1
24.9	57.64 .22	56.7 3.7	30 77 .15	69.6 3.4	41.93 .15	54.1 1.0	2.74 .12	19.8 3.3
Dec. 4.9	57.94 +.37	53.1 −3.5	30.95 +.20	66.2 −3.3	42.10 +.20	55.2 −1.2	2.89 +.17	16.6 −3.3
14.9	58.38 .51	49.7 3.3	31.18 .25	62.9 3.2	42.33 .24	56.5 1.4	3.09 .23	13.3 3.2
24.9	58.96 .64	46.6 2.9	31.46 .30	59.8 3.0	42.59 .27	58.0 1.5	3.34 .27	10.2 3.0
34.8	59.66 +.74	44.0 −2.4	31.78 +.33	57.0 −2.6	42.87 +.30	59.5 −1.6	3.63 +.31	7.3 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ^{2} Ursæ Minoris.		α Coronæ Borealis.		α Serpentis.		ε Serpentis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$15^{h}\ 20^{m}$	$+72^{\circ}\ 14'$	$15^{h}\ 29^{m}$	$+27^{\circ}\ 6'$	$15^{h}\ 38^{m}$	$+6^{\circ}\ 47'$	$15^{h}\ 44^{m}$	$+4^{\circ}\ 49'$
	s	″	s	″	s	″	s	″
(Dec. 30.9)	52.00 +.55	57.7 −2.8	41.25 +.27	36.3 −2.7	27.35 +.26	48.1 −2.1	56.04 +.26	59.1 −2.0
Jan. 9.8	52.60 .65	55.1 2.4	41.54 .30	33.7 2.4	27.63 .29	46.1 2.0	56.32 .29	57.1 1.9
19.8	53.29 .71	53.0 1.8	41.85 .32	31.5 2.1	27.92 .30	44.2 1.8	56.61 .30	55.3 1.8
29.8	54.03 .75	51.5 1.2	42.17 .33	29.6 1.7	28.23 .31	42.4 1.6	56.92 .31	53.6 1.6
Feb. 8.8	54.80 .77	50.6 −0.5	42.50 .33	28.2 1.2	28.54 .31	41.0 1.3	57.23 .31	52.2 1.3
18.7	55.56 +.76	50.4 +0.2	42.82 +.32	27.2 −0.7	28.84 +.30	39.9 −1.0	57.53 +.30	51.0 −1.0
28.7	56.31 .72	51.0 0.8	43.13 .30	26.8 −0.1	29.14 .28	39.1 0.6	57.82 .29	50.2 0.7
Mar. 10.7	57.00 .65	52.1 1.4	43.42 .28	27.0 +0.4	29.41 .26	38.7 −0.2	58.10 .27	49.8 −0.3
20.7	57.62 .57	53.8 2.0	43.68 .25	27.6 0.8	29.66 .24	38.6 +0.1	58.36 .25	49.7 +0.1
30.6	58.14 .48	56.1 2.5	43.92 .22	28.6 1.3	29.89 .22	38.9 0.5	58.59 .22	49.9 0.4
Apr. 9.6	58.56 +.37	58.8 +2.9	44.12 +.19	30.1 +1.7	30.10 +.19	39.5 +0.7	58.80 +.20	50.4 +0.7
19.6	58.87 .25	61.8 3.1	44.29 .15	31.9 2.0	30.28 .16	40.4 1.0	58.98 .17	51.2 0.9
29.5	59.06 .13	65.0 3.2	44.43 .12	34.0 2.1	30.43 .14	41.5 1.2	59.14 .14	52.2 1.1
May 9.5	59.12 +.01	68.3 3.3	44.53 .09	36.2 2.3	30.55 .11	42.7 1.3	59.27 .11	53.4 1.2
19.5	59.06 −.12	71.5 3.2	44.60 .05	38.5 2.3	30.64 .08	44.1 1.4	59.37 .08	54.6 1.3
29.5	58.89 −.23	74.6 +3.0	44.64 +.02	40.8 +2.3	30.70 +.05	45.5 +1.4	59.44 +.05	56.0 +1.3
June 8.4	58.61 .33	77.5 2.7	44.64 −.02	43.1 2.2	30.74 +.02	46.9 1.4	59.48 +.02	57.3 1.3
18.4	58.23 .43	80.1 2.4	44.60 .05	45.2 2.0	30.74 −.02	48.3 1.3	59.49 −.01	58.6 1.3
28.4	57.76 .51	82.3 2.0	44.54 .08	47.1 1.8	30.70 .05	49.6 1.2	59.46 .04	59.8 1 2
July 8.4	57.21 .58	84.1 1.6	44.44 .11	48.8 1.6	30.65 .07	50.8 1.1	59.41 .07	61.0 1.1
18.3	56.60 −.64	85.4 +1.1	44.31 −.14	50.2 +1.2	30.56 −.10	51.8 +1.0	59.32 −.10	62.0 +0.9
28.3	55.94 .68	86.2 +0.6	44.16 .16	51.3 0.9	30.44 .12	52.7 0.8	59.22 .12	62.8 0.8
Aug. 7.3	55.24 .70	86.5 0.0	43.99 .18	52.0 0.6	30.31 .14	53.4 0.6	59.08 .14	63.5 0.6
17.2	54.53 .71	86.3 −0.5	43.81 .19	52.4 +0.2	30.16 .16	53.9 0.4	58.93 .15	64.1 0.5
27.2	53.82 .71	85.5 1.0	43.61 .19	52.4 −0.1	30.00 .16	54.2 +0.2	58.77 .16	64.4 0.3
Sept. 6.2	53.13 −.68	84.2 −1.5	43.42 −.19	52.1 −0.5	29.83 −.16	54.3 0.0	58.61 −.16	64.6 +0.1
16.2	52.47 .63	82.4 2.0	43.24 .18	51.4 0.9	29.67 .15	54.2 −0.2	58.45 .15	64.6 −0.2
26.1	51.87 .57	80.2 2.4	43.07 .16	50.4 1.3	29.53 .13	53.9 0.5	58.30 .13	64.3 0.4
Oct. 6.1	51.33 .49	77.6 2.8	42.93 .13	48.9 1.6	29.41 .11	53.3 0.7	58.18 .11	63.8 0.6
16.1	50.88 .40	74.6 3.2	42.82 .09	47.1 1.9	29.32 .07	52.5 1.0	58.09 .07	63.1 0.8
26.1	50.54 −.28	71.2 −3.4	42.75 −.04	45.0 −2.2	29.27 −.03	51.4 −1.2	58.03 −.03	62.1 −1.1
Nov. 5.0	50.32 .16	67.7 3.6	42.73 +.01	42.7 2.5	29.26 +.02	50.1 1.4	58.02 +.01	60.9 1.3
15.0	50.22 −.03	64.0 3.8	42.76 .06	40.1 2.7	29.31 .07	48.5 1.7	58.06 .06	59.5 1.5
25.0	50.26 +.11	60.2 3.8	42.85 .11	37.3 2.9	29.40 .12	46.8 1.8	58.15 .11	57.9 1.7
Dec. 4.9	50.43 +.24	56.5 −3.7	42.99 +.16	34.4 −2.9	29.54 +.16	44.9 −2.0	58.28 +.16	56.1 −1.9
14.9	50.74 .37	52.9 3.4	43.18 .21	31.4 2.9	29 73 .20	42.8 2.1	58.46 .20	54.2 2.0
24.9	51.18 .49	49.6 3.1	43.41 .25	28.6 2.8	29 95 .24	40.7 2.1	58.69 .24	52.2 2.0
34.9	51.73 +.60	46.7 −2.7	43.68 +.29	25.8 −2.6	30.21 +.28	38.6 −2.1	58.94 +.27	50.2 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpii.		β¹ Scorpii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 15 48	° ′ +78 9	h m 15 52	° ′ +27 12	h m 15 53	° ′ −22 17	h m 15 58	° ′ −19 28
	s	″	s	″	s	″	s	″
(Dec. 30.9)	11.66 +.67	10.6 −3.0	41.80 +.26	65.8 −2.7	21.57 +.29	1.0 −0.7	34.71 +.28	49.5 −0.9
Jan. 9.9	12.41 .83	7.8 2.6	42.08 .29	63.1 2.5	21.87 .31	1.8 0.9	35.00 .30	50.4 1.0
19.8	13.31 .95	5.5 2.0	42.38 .31	60.8 2.2	22.19 .33	2.7 1.0	35.32 .32	51.5 1.0
29.8	14.30 1.04	3.8 1.4	42.69 .32	58.8 1.8	22.52 .33	3.8 1.1	35.64 .33	52.5 1.1
Feb. 8.8	15.38 1.09	2.6 0.8	43.01 .32	57.2 1.3	22.86 .33	4.8 1.1	35.97 .33	53.6 1.1
18.7	16.48 +1.10	2.2 −0.1	43.34 +.32	56.2 −0.8	23.19 +.33	5.9 −1.0	36.30 +.32	54.7 −1.0
28.7	17.57 1.07	2.4 +0.6	43.65 .31	55.7 −0.3	23.52 .32	6.9 1.0	36.61 .31	55.6 0.9
Mar. 10.7	18.61 1.00	3.3 1.2	43.95 .29	55.7 +0.3	23.82 .30	7.9 0.9	36.92 .29	56.5 0.8
20.7	19.57 .92	4.8 1.8	44.22 .26	56.2 0.8	24.11 .28	8.7 0.8	37.20 .27	57.3 0.7
30.6	20.41 .77	6.8 2.3	44.47 .24	57.2 1.2	24.38 .25	9.5 0.7	37.47 .25	57.9 0.6
Apr. 9.6	21.10 +.62	9.4 +2.7	44.70 +.21	58.6 +1.6	24.62 +.23	10.2 −0.6	37.71 +.23	58.4 −0.4
19.6	21.64 .45	12.2 3.0	44.89 .18	60.4 1.9	24.83 .20	10.7 0.5	37.92 .20	58.8 0.3
29.6	21.99 .27	15.3 3.2	45.05 .14	62.4 2.2	25.02 .18	11.2 0.4	38.12 .18	59.1 0.2
May 9.5	22.17 +.08	18.6 3.3	45.18 .11	64.7 2.3	25.18 .15	11.5 0.3	38.28 .15	59.2 0.1
19.5	22.16 −.10	21.9 3.3	45.27 .08	67.1 2.4	25.31 .11	11.8 0.2	38.41 .12	59.3 −0.1
29.5	21.96 −.28	25.1 +3.1	45.33 +.04	69.5 +2.4	25.41 +.08	12.0 −0.2	38.51 +.08	59.4 0.0
June 8.4	21.60 .45	28.2 2.9	45.35 .00	71.8 2.3	25.47 .05	12.2 0.1	38.58 .05	59.4 0.0
18.4	21.07 .60	30.9 2.6	45.33 −.03	74.1 2.2	25.50 +.01	12.3 −0.1	38.61 +.01	59.3 +0.1
28.4	20.39 .74	33.4 2.3	45.28 .07	76.2 2.0	25.49 −.02	12.3 0.0	38.60 −.02	59.2 0.1
July 8.4	19.59 .86	35.4 1.8	45.20 .10	78.0 1.7	25.45 .06	12.3 +0.1	38.57 .05	59.0 0.2
18.3	18.68 −.96	37.0 +1.3	45.08 −.13	79.6 +1.4	25.38 −.09	12.2 +0.1	38.50 −.09	58.8 +0.2
28.3	17.68 1.03	38.1 0.9	44.94 .16	80.8 1.1	25.27 .12	12.0 0.2	38.39 .12	58.6 0.3
Aug. 7.3	16.62 1.09	38.7 +0.4	44.77 .18	81.8 0.8	25.14 .15	11.7 0.3	38.26 .14	58.3 0.3
17.3	15.51 1.12	38.8 −0.2	44.59 .19	82.3 +0.4	24.98 .16	11.4 0.4	38.12 .16	57.9 0.4
27.2	14.39 1.12	38.4 0.7	44.39 .20	82.6 0.0	24.81 .17	11.0 0.5	37.95 .17	57.5 0.4
Sept. 6.2	13.28 −1.09	37.4 −1.2	44.19 −.20	82.4 −0.3	24.64 −.17	10.5 +0.5	37.78 −.17	57.1 +0.5
16.2	12.21 1.05	36.0 1.7	43.99 .19	81.9 0.7	24.47 .16	9.9 0.6	37.61 .16	56.6 0.5
26.1	11.20 .97	34.1 2.2	43.81 .17	81.0 1.1	24.32 .14	9.4 0.6	37.46 .14	56.1 0.5
Oct. 6.1	10.28 .86	31.7 2.6	43.65 .15	79.7 1.4	24.18 .12	8.8 0.6	37.32 .12	55.7 0.4
16.1	9.48 .74	29.0 2.9	43.52 .11	78.1 1.8	24.09 .08	8.2 0.5	37.22 .08	55.2 0.4
26.1	8.81 −.59	25.9 −3.2	43.43 −.07	76.1 −2.1	24.03 −.03	7.8 +0.4	37.16 −.04	54.9 +0.3
Nov. 5.0	8.31 .41	22.5 3.5	43.38 −.02	73.8 2.4	24.02 +.02	7.4 0.3	37.15 +.01	54.7 +0.1
15.0	7.99 .23	18.9 3.6	43.39 +.03	71.3 2.6	24.07 .07	7.2 +0.2	37.19 .06	54.7 0.0
25.0	7.86 −.03	15.3 3.7	43.45 .09	68.5 2.8	24.16 .13	7.1 0.0	37.28 .12	54.8 −0.2
Dec. 5.0	7.94 +.18	11.6 −3.7	43.56 +.14	65.7 −2.9	24.32 +.17	7.3 −0.3	37.42 +.17	55.1 −0.4
14.9	8.21 .38	8.0 3.5	43.73 .19	62.7 2.9	24.52 .22	7.6 0.5	37.61 .21	55.6 0.6
24.9	8.68 .56	4.6 3.2	43.94 .23	59.8 2.8	24.76 .26	8.2 0.6	37.85 .25	56.2 0.8
34.9	9.34 +.74	1.5 −2.9	44.19 +.26	57.1 −2.7	25.04 +.29	8.9 −0.8	38.12 +.28	57.1 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		τ Herculis.		α Scorpii. (*Antares.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$16^{h}\ 5^{m}$	$+68^{\circ}\ 6'$	$16^{h}\ 8^{m}$	$-3^{\circ}\ 23'$	$16^{h}\ 16^{m}$	$+46^{\circ}\ 35'$	$16^{h}\ 22^{m}$	$-26^{\circ}\ 10'$
	s	″	s	″	s	″	s	″
(Dec. 30.9)	56.93 +.39	64.4 −3.2	9.70 +.25	22.1 −1.6	10.54 +.25	32.7 −3.2	10.41 +.28	3.0 −0.3
Jan. 9.9	57.36 .47	61.3 2.8	9.97 .28	23.7 1.6	10.82 .30	29.6 2.9	10.70 .30	3.4 0.5
19.8	57.87 .54	58.7 2.3	10.26 .29	25.3 1.5	11.14 .34	26.9 2.5	11.01 .32	4.0 0.6
29.8	58.44 .60	56.6 1.8	10.56 .30	26.7 1.4	11.49 .36	24.6 2.0	11.34 .34	4.7 0.7
Feb. 8.8	59.05 .63	55.2 1.1	10.86 .31	28.0 1.2	11.87 .38	22.9 1.4	11.69 .34	5.5 0.8
18.8	59.69 +.64	54.4 −0.5	11.17 +.30	29.1 −1.0	12.25 +.38	21.8 −0.8	12.03 +.34	6.3 −0.8
28.7	60.32 .63	54.2 +0.2	11.47 .29	30.0 0.7	12.63 .38	21.3 −0.2	12.36 .33	7.1 0.8
Mar. 10.7	60.94 .60	54.8 0.9	11.75 .28	30.6 0.5	13.00 .36	21.5 +0.5	12.69 .32	7.9 0.8
20.7	61.51 .55	56.0 1.5	12.02 .26	30.9 −0.2	13.34 .33	22.2 1.1	13.00 .30	8.6 0.7
30.7	62.08 .48	57.8 2.0	12.27 .24	31.0 +0.1	13.66 .30	23.6 1.6	13.29 .28	9.3 0.7
Apr. 9.6	62.47 +.41	60.1 +2.5	12.50 +.22	30.8 +0.3	13.95 +.27	25.5 +2.1	13.56 +.26	9.9 −0.6
19.6	62.84 .32	62.8 2.9	12.71 .19	30.3 0.5	14.20 .22	27.8 2.5	13.81 .23	10.5 0.5
29.6	63.11 .23	65.8 3.2	12.89 .17	29.7 0.7	14.40 .18	30.5 2.8	14.03 .21	11.0 0.5
May 9.5	63.29 .13	69.1 3.3	13.05 .14	28.9 0.8	14.56 .13	33.4 3.0	14.23 .18	11.4 0.4
19.5	63.37 +.03	72.4 3.3	13.18 .11	28.1 0.9	14.67 .08	36.4 3.1	14.39 .15	11.8 0.4
29.5	63.35 −.07	75.7 +3.3	13.27 +.08	27.2 +0.9	14.73 +.04	39.5 +3.1	14.52 +.11	12.2 −0.3
June 8.5	63.24 .16	78.9 3.1	13.34 .05	26.2 1.0	14.74 −.01	42.5 3.0	14.61 .08	12.5 0.3
18.4	63.04 .25	81.9 2.9	13.37 +.02	25.2 0.9	14.70 .06	45.4 2.8	14.67 +.04	12.8 0.3
28.4	62.75 .33	84.6 2.5	13.37 −.02	24.3 0.9	14.61 .11	48.1 2.5	14.69 .00	13.1 0.2
July 8.4	62.38 .40	87.0 2.1	13.34 .05	23 4 0.8	14.48 .15	50.5 2.2	14.67 −.04	13.2 0.1
18.4	61.95 −.47	88.9 +1.7	13.27 −.08	22.6 +0.8	14.31 −.19	52.5 +1.8	14.61 −.08	13.4 −0.1
28.3	61.46 .52	90 4 1.2	13.18 .11	21.9 0.7	14.10 .23	54.2 1.4	14.52 .11	13.4 0.0
Aug. 7.3	60.92 .56	91.4 0.7	13.05 .13	21.3 0.6	13.85 .26	55.4 1.0	14.39 .14	13.3 +0.1
17.3	60.35 .58	91.8 +0.2	12.91 .15	20.8 0.5	13.58 .28	56.2 0.5	14.23 .16	13.2 0.2
27.2	59.76 .60	91.8 −0.3	12.75 .16	20.4 0.4	13.30 .29	56.5 +0.1	14.06 .18	12.9 0.3
Sept. 6.2	59.16 −.59	91.3 −0.8	12.59 −.17	20.1 +0.2	13.01 −.29	56.3 −0.4	13.88 −.18	12.6 +0.4
16.2	58.58 .57	90.2 1.3	12.42 .16	20.0 +0.1	12.72 .29	55.6 0.9	13.69 .18	12.1 0.5
26.2	58.02 .53	88.6 1.8	12.27 .15	19.9 −0.1	12.44 .27	54.5 1.4	13.52 .16	11.5 0.6
Oct. 6.1	57.51 .48	86.6 2.3	12.13 .12	20.1 0.2	12.18 .24	52.9 1.8	13.36 .14	10.9 0.6
16.1	57.06 .41	84.1 2.7	12.02 .09	20.4 0.4	11.96 .20	50.9 2.2	13.24 .10	10.3 0.6
26.1	56.69 −.33	81.2 −3.1	11.96 −.05	20.9 −0.6	11.79 −.15	48.4 −2.6	13.16 −.06	9.7 +0.6
Nov. 5.1	56.40 .23	78.0 3.3	11.93 .00	21.6 0.8	11.66 .09	45.7 2.9	13.12 −.01	9.1 0.5
15.0	56.22 .13	74.5 3.6	11.95 +.05	22.4 1.0	11.60 −.03	42.6 3.2	13.14 +.04	8.6 0.4
25.0	56.15 −.01	70.9 3.7	12.02 .10	23.5 1.2	11.60 +.03	39.2 3.4	13.21 .10	8.2 0.3
Dec. 5.0	56.20 +.10	67.2 −3.7	12.14 +.14	24.8 −1.3	11.67 +.10	35.8 −3.5	13.33 +.15	8.1 +0.1
14.9	56.35 .21	63.4 3.6	12.30 .19	26.2 1.5	11.80 .16	32.3 3.5	13.51 .20	8.0 −0.1
24.9	56.62 .32	59.9 3.4	12.51 .23	27.8 1.6	11.99 .22	28.9 3.4	13.73 .24	8.2 0.3
34.9	56.99 +.42	56.6 −3.1	12.75 +.26	29.4 −1.6	12.24 +.27	25.6 −3.1	14.00 +.28	8.5 −0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Draconis.		β Herculis.		A Draconis.		ζ Ophiuchi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 16 22	° ′ +61 46	h m 16 25	° ′ +21 44	h m 16 28	° ′ +69 1	h m 16 30	° ′ −10 19
	s	″	s	″	s	″	s	″
(Dec. 30.9)	21.48 +.30	43.8 −3.4	8.44 +.23	47.1 −2.6	9.74 +.34	14.2 −3.4	39.64 +.24	35.2 −1.1
Jan. 9.9	21.81 .37	40.6 3.0	8.68 .26	44.6 2.4	10.13 .44	11.0 3.0	39.90 .27	36.3 1.2
19.9	22.22 .43	37.8 2 5	8.96 .28	42.3 2.2	10.62 .52	8.2 2.5	40.18 .29	37 5 1.2
29.8	22.67 .48	35.5 2.0	9.25 .30	40.2 1.8	11.17 .59	5.9 2.0	40.47 .30	38.7 1.1
Feb. 8.8	23.17 .51	33.8 1.4	9.55 .31	38.6 1.4	11.79 .63	4.2 1.4	40.78 .31	39.8 1.0
18.8	23.68 +.52	32.7 −0.7	9.86 +.31	37.4 −1.0	12.44 +.65	3.1 −0.7	41.09 +.31	40.7 −0.9
28.7	24.20 .51	32.3 −0.1	10.17 .30	36.6 −0.5	13.09 .65	2.7 −0.1	41.40 .30	41.5 0.7
Mar. 10.7	24.70 .49	32.6 +0.6	10.47 .29	36.4 0.0	13.74 .63	3.0 +0.6	41.69 .29	42.1 0.5
20.7	25.18 .46	33.5 1.2	10.75 .27	36.7 +0.5	14.36 .59	3.9 1.3	41.98 .28	42.5 0.3
30.7	25.62 .42	35.1 1.8	11.01 .25	37.4 0.9	14.92 .54	5.5 1.8	42.25 .26	42.7 −0.1
Apr. 9.6	26.01 +.36	37.2 +2.3	11.26 +.23	38.5 +1.3	15.42 +.46	7.6 +2.3	42.50 +.24	42.7 +0.1
19.6	26.34 .30	39.7 2.7	11.47 .20	40.0 1.7	15.85 .38	10.2 2.8	42.73 .22	42.5 0.3
29.6	26.60 .23	42.6 3.0	11.66 .17	41.9 1.9	16.18 .29	13.1 3.1	42.94 .19	42.2 0.4
May 9.6	26.79 .16	45.8 3.2	11.82 .14	43.9 2.1	16.42 .19	16.3 3.3	43.12 .17	41.7 0.5
19.5	26.91 +.08	49.1 3.3	11.95 .11	46.1 2.2	16.56 +.09	19.6 3.4	43.27 .14	41.1 0.6
29.5	26.95 .00	52.4 +3.3	12.04 +.06	48.4 +2.3	16.59 −.02	23.0 +3.3	43.39 +.11	40.5 +0.6
June 8.5	26.92 −.07	55.7 3.2	12.10 +.04	50.6 2.2	16.52 .12	26.2 3.2	43.48 .07	39.9 0.6
18.4	26.82 .14	58.8 3.0	12.12 .00	52.8 2.1	16.36 .21	29.4 3.0	43.54 +.04	39.3 0.6
28.4	26.64 .21	61.6 2.7	12.11 −.03	54.9 2.0	16.10 .30	32.3 2.8	43.56 .00	38.7 0.6
July 8.4	26.40 .27	64 2 2.4	12.06 .06	56.8 1.8	15.76 .39	34.9 2.4	43.55 −.03	38.1 0.6
18.4	26.10 −.33	66.3 +2.0	11.98 −.10	58.4 +1.5	15.33 −.46	37.1 +2.0	43.50 −.07	37.5 +0.5
28.3	25.75 .38	68.1 1.5	11.86 .13	59.8 1.3	14.84 .52	38.8 1.5	43.42 .10	37.0 0.5
Aug. 7.3	25.35 .41	69.3 1.0	11.71 .16	61.0 1.0	14.29 .57	40.1 1.1	43.30 .13	36.5 0.4
17.3	24.92 .44	70.1 +0.5	11.54 .18	61.8 0.7	13.70 .61	40.9 +0.6	43.17 .15	36.1 0.4
27.3	24.47 .46	70.4 0.0	11.36 .19	62.2 +0.3	13.08 .63	41.2 0.0	43.01 .16	35.7 0.4
Sept. 6.2	24.01 −.46	70.1 −0.5	11.16 −.20	62.4 0.0	12.45 −.63	41.0 −0.5	42.84 −.17	35.4 +0.3
16.2	23.55 .45	69.4 1.0	10.97 .19	62.2 −0.4	11.82 .62	40.2 1.0	42.67 .17	35.1 0.2
26.2	23.11 .43	68.1 1.5	10.78 .18	61.6 0.7	11.21 .59	39.0 1.5	42.50 .16	35.0 0.1
Oct. 6.1	22.70 .39	66.3 2.0	10.61 .16	60.8 1.1	10.64 .54	37.2 2.0	42.36 .13	34.9 +0.1
16.1	22.34 .34	64.1 2.4	10.47 .13	59.5 1.4	10.13 .48	35.0 2.4	42.24 .10	34.9 −0.1
26.1	22.04 −.27	61.4 −2.8	10.36 −.09	57.9 −1.7	9.69 −.40	32.3 −2.8	42.15 −.07	35.0 −0.2
Nov. 5.1	21.80 .20	58.4 3.2	10.29 −.04	56.1 2.0	9.33 .30	29.3 3.2	42.11 −.02	35.3 0.4
15.0	21.64 .11	55.1 3.4	10.27 +.01	53.9 2.3	9.08 .20	26.0 3.4	42.11 +.03	35.7 0.5
25.0	21.58 −.02	51.6 3.6	10.30 .06	51.5 2.5	8.94 −.08	22.4 3.6	42.16 .08	36.3 0.7
Dec. 5.0	21.60 +.07	47.9 −3.7	10.38 +.11	49.0 −2.6	8.92 +.04	18.8 −3.7	42.26 +.13	37.1 −0.9
15.0	21.72 .16	44 2 3.7	10.52 .16	46.3 2.7	9.02 .16	15.1 3.7	42.42 .17	38.0 1.0
24.9	21.93 .25	40.6 3.5	10.70 .20	43.6 2.7	9.23 .27	11.5 3.5	42.61 .21	39.1 1.1
34.9	22.22 +.33	37.2 −3.3	10.92 +.24	41.0 −2.6	9.56 +.38	8.1 −3.3	42.84 +.25	40.2 −1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Trianguli Australis.		η Herculis.		κ Ophiuchi.		d Herculis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$16^{h}\ 36^{m}$	$-68°\ 48'$	$16^{h}\ 38^{m}$	$+39°\ 8'$	$16^{h}\ 52^{m}$	$+9°\ 33'$	$16^{h}\ 57^{m}$	$+33°\ 44'$
	s	″	s	″	s	″	s	″
(Dec. 30.9)	10.02 +.55	19.9 +1.9	50.11 +.22	44.5 −3.1	4.70 +.21	33.3 −2.1	14.20 +.20	19.8 −3.0
Jan. 9.9	10.61 .63	18.2 1.5	50.35 .26	41.5 2.9	4.92 .24	31.3 2.0	14.41 .24	16.9 2.8
19.9	11.27 .69	16.9 1.1	50.64 .30	38.8 2.6	5.17 .26	29.3 1.9	14.67 .27	14.2 2.5
29.8	11.99 .74	16.0 0.7	50.95 .32	36.4 2.1	5.44 .28	27.6 1.6	14.96 .30	11.9 2.2
Feb. 8.8	12.75 .76	15.5 +0.3	51.28 .34	34.6 1.6	5.73 .29	26.1 1.3	15.26 .31	9.9 1.7
18.8	13 52 +.78	15.4 −0.1	51.62 +.35	33.2 −1.0	6.02 +.30	24.9 −1.0	15.59 +.32	8.5 −1.2
28.8	14.29 .77	15.8 0.5	51.97 .34	32.5 −0.4	6.32 .29	24.1 0.6	15.91 .33	7.6 −0.6
Mar. 10.7	15.06 .75	16.5 0.9	52.31 .33	32.3 +0.2	6.61 .29	23.7 −0.2	16.24 .32	7.3 0.0
20.7	15.79 .72	17.6 1.2	52.64 .32	32.8 0.8	6.89 .27	23.6 +0.2	16.55 .31	7.5 +0.5
30.7	16.49 .68	19.0 1.6	52.94 .29	33.8 1.3	7.16 .26	24.0 0.5	16.85 .29	8.4 1.1
Apr. 9.6	17.14 +.62	20.7 −1.8	53.22 +.27	35.4 +1.8	7.41 +.24	24.7 +0.9	17.13 +.27	9.7 +1.6
19.6	17.73 .56	22.7 2.1	53.48 .23	37.4 2.2	7.65 .22	25.8 1.2	17.39 .24	11.5 2.0
29.6	18.26 .49	24.8 2.2	53.69 .20	39.8 2.6	7.86 .20	27.1 1.4	17.61 .21	13.7 2.3
May 9.6	18.71 .41	27.1 2.4	53.87 .16	42.5 2.8	8.04 .17	28.6 1.6	17.81 .18	16.1 2.6
19.5	19.08 .32	29.6 2.5	54.01 .12	45.3 2.9	8.20 .14	30.2 1.7	17.97 .14	18.8 2.7
29.5	19.36 +.23	32.1 −2.5	54.10 +.07	48.2 +2.9	8.33 +.11	32.0 +1.8	18 09 +.10	21.6 +2.8
June 8.5	19.54 .14	34.7 2.5	54.16 +.03	51.2 2.9	8.42 .08	33.8 1.8	18.17 .06	24.4 2.8
18.5	19.62 +.03	37.2 2.4	54.16 −.01	54.0 2.8	8.48 .04	35.5 1.7	18.20 +.02	27.2 2.7
28.4	19.61 −.07	39.5 2.3	54.13 .06	56.7 2.6	8.51 +.01	37.2 1.6	18.20 −.03	29.8 2 5
July 8.4	19.49 .16	41.7 2.0	54.05 .10	59.1 2.3	8.50 −.03	38.8 1.5	18.15 .07	32.2 2.3
18.4	19.28 −.26	43 6 −1.8	53.93 −.14	61.3 +2.0	8.45 −.07	40.2 +1.3	18.06 −.11	34.4 +2.0
28.3	18.98 .34	45 2 1.4	53.77 .18	63.1 1.6	8.36 .10	41.4 1.1	17.93 .15	36.3 1.7
Aug. 7.3	18.60 .41	46.5 1.0	53.57 .21	64.5 1.2	8.25 .13	42.4 0.9	17.77 .18	37.8 1.4
17.3	18.16 .47	47.3 0.6	53.35 .23	65.5 0.8	8.11 .15	43.2 0.7	17.58 .20	39.0 1.0
27.3	17.68 .50	47.7 −0.1	53.11 .25	66.1 +0.4	7.95 .17	43.8 0.5	17.36 .22	39.8 0.6
Sept. 6.2	17.16 −.52	47.6 +0.3	52.86 −.26	66.3 −0.1	7.77 −.18	44.2 +0.2	17.13 −.24	40.2 +0.2
16.2	16.65 .51	47.0 0.8	52 60 .25	66.0 0.5	7.59 .18	44.2 0.0	16.90 .24	40.1 −0.3
26.2	16.15 .47	46.0 1.3	52.35 .24	65.2 1.0	7.41 .17	44.1 −0.3	16.66 .23	39.6 0.7
Oct. 6.2	15.70 .42	44 5 1.7	52.12 .22	64.0 1.4	7.24 .16	43.7 0.6	16.44 .21	38.7 1.1
16.1	15.33 .34	42.6 2.0	51.92 .19	62.4 1.8	7.10 .13	43.0 0.8	16.24 .18	37.4 1.5
26.1	15.04 −.24	40.4 +2.3	51.75 −.15	60.3 −2.2	6.98 −.09	42.0 −1.1	16.08 −.14	35.6 −1.9
Nov. 5.1	14.85 −.13	38.0 2.5	51.63 .10	57.9 2.6	6.91 .05	40.8 1.3	15.96 .10	33.5 2.3
15.0	14.79 .00	35.4 2.6	51.56 −.04	55.2 2.9	6.88 −.01	39.3 1.6	15.88 −.05	31.1 2.6
25.0	14.85 +.12	32.7 2.6	51.55 +.02	52.2 3.1	6·90 +.04	37.6 1.8	15.86 .00	28.3 2.8
Dec. 5.0	15.04 +.25	30.1 +2.5	51.60 +.08	49.0 −3.2	6.96 +.09	35.8 −1.9	15.90 +.06	25.4 −3.0
15.0	15.35 .37	27.7 2.3	51.70 .13	45.7 3.3	7.08 .14	33.8 2.1	15.98 .11	22.3 3.1
24.9	15.78 .48	25.5 2.1	51.86 .19	42.4 3.2	7.23 .18	31.7 2.1	16.12 .16	19.2 3.1
34.9	16.30 +.57	23.6 +1.7	52.08 +.24	39.2 −3.1	7.43 +.21	29.6 −2.0	16.32 +.21	16.2 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Ursæ Minoris. Right Ascension.	ε Ursæ Minoris. Declination North.	α¹ Herculis. Right Ascension.	α¹ Herculis. Declination North.	b Ophiuchi. Right Ascension.	b Ophiuchi. Declination South.	β Draconis. Right Ascension.	β Draconis. Declination North.
	h m 16 57	+82° 13′	h m 17 9	+14° 31′	h m 17 19	−24° 3′	h m 17 27	+52° 23′
	s	″	s	″	s	″	s	″
(Dec. 30.9)	54.61 +.48	38.7 −3.3	15.62 +.19	32.2 −2.3	9.69 +.22	50.7 −0.2	44.32 +.17	18.2 −3.4
Jan. 9.9	55.26 .80	35.5 3.0	15.83 .22	29.9 2.2	9.93 .25	50.9 0.2	44.52 .23	14.8 3.3
19.9	56.20 1.07	32.6 2.7	16.07 .25	27.8 2.0	10.20 .28	51.2 0.3	44.78 .28	11.7 3.0
29.9	57.39 1.29	30.2 2.2	16.33 .27	25.9 1.8	10.49 .30	51.6 0.4	45.08 .33	8.9 2.6
Feb. 8.8	58.76 1.46	28.3 1.6	16.61 .29	24.3 1.4	10.80 .32	51.9 0.4	45.44 .37	6.6 2.1
18.8	60.28+1.57	27.0 −1.0	16.90 +.29	23.0 −1.1	11.12 +.32	52.3 −0.4	45.82 +.39	4.8 −1.5
28.8	61.89 1.63	26.3 −0.4	17.20 .29	22.2 0.7	11.45 .33	52.7 0.3	46.22 .41	3.6 0.9
Mar. 10.7	63.51 1.62	26.3 +0.3	17.49 .29	21.7 −0.2	11.77 .32	53.0 0.3	46.63 .41	3.1 −0.2
20.7	65.10 1.55	26.9 0.9	17.78 .28	21.7 +0.2	12.09 .32	53.3 0.2	47.04 .41	3.2 +0.5
30.7	66.60 1.43	28.1 1.5	18.05 .27	22.2 0.6	12.40 .31	53.5 0.2	47.43 .39	4.0 1.1
Apr. 9.7	67.95+1.26	30.0 +2.1	18.32 +.26	23.0 +1.0	12.70 +.29	53.6 −0.1	47.81 +.36	5.4 +1.7
19.6	69.10 1.05	32.3 2.5	18.56 .24	24.2 1.4	12.99 .27	53.7 −0.1	48.15 .32	7.4 2.2
29.6	70.03 .81	35.0 2.9	18.79 .21	25.7 1.6	13.25 .25	53.8 0.0	48.46 .29	9.7 2.6
May 9.6	70.71 .54	38.0 3.1	18.99 .19	27.5 1.8	13.49 .23	53.8 0.0	48.72 .24	12.5 2.9
19.6	71.11 +.26	41.2 3.2	19.16 .16	29.4 2.0	13.71 .20	53.8 0.0	48.93 .19	15.6 3.2
29.5	71.23 −.02	44.5 +3.3	19.30 +.12	31.4 +2.1	13.89 +.17	53.8 0.0	49.09 +.13	18.9 +3.3
June 8.5	71.07 .30	47.8 3.2	19.41 .09	33.5 2.1	14.04 .13	53.8 0.0	49.19 .07	22.2 3.3
18.5	70.63 .57	51.0 3.1	19.48 .05	35.6 2.0	14.15 .09	53.9 −0.1	49.23 +.01	25.5 3.3
28.4	69.94 .82	53.9 2.9	19.51 +.02	37.5 1.9	14.22 .05	54.0 0.1	49.21 −.05	28.7 3.1
July 8.4	68.99 1.06	56.7 2.6	19.51 −.02	39.4 1.8	14.26 +.01	54.1 0.1	49.13 .11	31.7 2.9
18.4	67.83−1.26	59.1 +2.2	19.47 −.06	41.0 +1.6	14.24 −.03	54.2 −0.1	49.00 −.16	34.5 +2.6
28.4	66.47 1.44	61.1 1.8	19.39 .10	42.5 1.4	14.19 .07	54.2 −0.1	48.81 .21	36.9 2.3
Aug. 7.3	64.95 1.58	62.6 1.3	19.28 .13	43.7 1.1	14.10 .11	54.3 0.0	48.57 .26	39.0 1.8
17.3	63.31 1.70	63.8 0.9	19.14 .15	44.7 0.8	13.97 .14	54.3 0.0	48.29 .30	40.6 1.4
27.3	61.57 1.77	64.4 +0.4	18.97 .17	45.4 0.6	13.81 .17	54.3 +0.1	47.97 .33	41.8 0.9
Sept. 6.3	59.78−1.80	64.5 −0.1	18.79 −.19	45.9 +0.3	13.63 −.18	54.2 +0.2	47.63 −.35	42.5 +0.5
16.2	57.97 1.80	64.1 0.6	18.60 .19	46.0 0.0	13.44 .19	54.0 0.2	47.28 .36	42.7 0.0
26.2	56.20 1.75	63.2 1.1	18.41 .18	45.8 −0.3	13.26 .18	53.8 0.3	46.92 .35	42.4 −0.6
Oct. 6.2	54.49 1.66	61.9 1.6	18.23 .17	45.4 0.6	13.08 .17	53.4 0.3	46.58 .33	41.6 1.1
16.1	52.90 1.52	60.0 2.1	18.07 .14	44.6 0.9	12.92 .14	53.1 0.4	46.26 .31	40.3 1.6
26.1	51.46−1.35	57.7 −2.5	17.94 −.11	43.6 −1.2	12.79 −.11	52.7 +0.4	45.97 −.27	38.5 −2.0
Nov. 5.1	50.21 1.13	55.1 2.8	17.85 .07	42.2 1.5	12.71 .06	52.3 0.4	45.73 .22	36.3 2.5
15.1	49.20 .88	52.1 3.1	17.80 −.03	40.6 1.7	12.66 −.02	52.0 0.3	45.54 .16	33.6 2.8
25.0	48.46 .60	48.8 3.4	17.80 +.02	38.7 2.0	12.68 +.04	51.7 0.2	45.42 .09	30.6 3.1
Dec. 5.0	48.00 −.30	45.4 −3.5	17.84 +.07	36.6 −2.1	12.74 +.09	51.5 +0.1	45.36 −.02	27.3 −3.4
15.0	47.86 +.01	41.8 3.5	17.93 .12	34.4 2.3	12.86 .14	51.4 0.0	45.38 +.05	23.9 3.5
25.0	48.03 .33	38.3 3.4	18.07 .16	32.1 2.3	13.02 .19	51.5 −0.1	45.47 .12	20.4 3.5
34.9	48.51 +.63	35.0 −3.3	18.25 +.20	29.8 −2.3	13.23 +.23	51.6 −0.2	45.62 +.19	16.9 −3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ophiuchi.		ω Draconis.		μ Herculis.		ψ^1 Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$17^{h}\ 29^{m}$	$+12^{\circ}\ 38'$	$17^{h}\ 37^{m}$	$+68^{\circ}\ 48'$	$17^{h}\ 41^{m}$	$+27^{\circ}\ 47'$	$17^{h}\ 43^{m}$	$+72^{\circ}\ 12'$
	s	″	s	″	s	″	s	″
Jan. 0.0	27.01 +.17	49.4 −2.2	34.82 +.16	42.3 −3.5	49.75 +.15	25.6 −2.8	57.58 +.15	21.2 −3.5
9.9	27.20 .21	47.3 2.1	35.04 .28	38.8 3.4	49.92 .19	22.8 2.7	57.80 .29	17.8 3.4
19.9	27.42 .24	45.2 2.0	35.37 .38	35.6 3.1	50.13 .23	20.2 2.5	58.14 .42	14.5 3.1
29.9	27.67 .26	43.4 1.7	35.79 .47	32.7 2.7	50.37 .26	17.8 2.2	58.62 .52	11.6 2.7
Feb. 8.8	27.94 .28	41.8 1.4	36.30 .54	30.3 2.1	50.64 .28	15.8 1.8	59.18 .61	9.1 2.2
18.8	28.22 +.29	40.5 −1.1	36.87 +.59	28.4 −1.6	50.93 +.29	14.1 −1.4	59.83 +.68	7.1 −1.6
28.8	28.51 .29	39.6 0.7	37.49 .63	27.1 0.9	51.23 .30	13.0 0.9	60.54 .72	5.8 1.0
Mar. 10.8	28.80 .29	39.2 −0.3	38.13 .64	26.5 −0.3	51.54 .31	12.4 −0.4	61.28 .75	5.1 −0.4
20.7	29.09 .29	39.1 +0.1	38.78 .64	26.6 +0.4	51.84 .30	12.3 +0.2	62.04 .75	5.1 +0.3
30.7	29.38 .28	39.5 0.6	39.40 .61	27.4 1.1	52.14 .30	12.8 0.7	62.77 .72	5.7 1.0
Apr. 9.7	29.65 +.26	40.2 +0.9	40.00 +.57	28.8 +1.7	52.44 +.28	13.8 +1.2	63.47 +.67	7.0 +1.6
19.7	29.90 .25	41.4 1.3	40.54 .51	30.7 2.2	52.71 .26	15.2 1.6	64.11 .60	8.9 2.1
29.6	30.14 .23	42.8 1.5	41.01 .44	33.1 2.6	52.96 .24	17.0 2.0	64.67 .52	11.3 2.6
May 9.6	30.36 .20	44.4 1.8	41.41 .35	36 0 3.0	53.19 .22	19.2 2.3	65.14 .42	14.0 2.9
19.6	30.55 .18	46.3 1.9	41.72 .26	39.1 3.3	53.39 .18	21.6 2.5	65.50 .31	17.1 3.2
29.5	30.71 +.14	48.3 +2.0	41.93 +.16	42.5 +3.4	53.56 +.15	24.2 +2.6	65.74 +.19	20.4 +3.4
June 8.5	30.84 .11	50.3 2 0	42.04 +.06	45.9 3.5	53.69 .11	26.9 2.7	65.87 +.07	23.9 3.4
18.5	30.93 .07	52.3 2.0	42.04 −.05	49.4 3.4	53.78 .07	29.6 2.6	65.88 −.05	27.3 3.4
28.5	30.98 +.04	54.3 1.9	41.95 .15	52.8 3.3	53.83 +.03	32.2 2.6	65.76 .18	30.6 3.3
July 8.4	31.00 .00	56.1 1.8	41.75 .24	55.9 3.1	53.84 −.02	34.7 2.4	65.52 .29	33.8 3.1
18.4	30.97 −.04	57.8 +1.6	41.46 −.33	58.9 +2.8	53.80 −.06	37.0 +2.2	65.18 −.40	36.8 +2.8
28.4	30.91 .08	59.2 1.4	41.08 .42	61.5 2.4	53.72 .10	39.0 1.9	64.73 .50	39.4 2.5
Aug. 7.4	30.82 .11	60.5 1.2	40.62 .49	63.6 2.0	53.60 .14	40.8 1.6	64.18 .58	41.7 2.1
17.3	30.68 .14	61.6 0.9	40.10 .55	65.5 1.6	53.45 .17	42.2 1.3	63.56 .66	43.6 1.6
27.3	30.53 .17	62.3 0.7	39.52 .60	66.8 1.1	53.27 .19	43.2 0.9	62.87 .72	44.9 1.2
Sept. 6.3	30.35 −.18	62.9 +0.4	38.91 −.63	67.6 +0.6	53.06 −.21	44.0 +0.5	62.13 −.76	45.8 +0.7
16.2	30.17 .19	63.1 +0.1	38.26 .65	68 0 +0.1	52.84 .22	44.3 +0.1	61.36 .78	46.2 +0.1
26.2	29.98 .19	63.1 −0.2	37.62 .64	67.7 −0.5	52.62 .22	44.3 −0.3	60.58 .77	46.1 −0.4
Oct. 6.2	29.80 .17	62.7 0.5	36.98 .62	67.0 1.0	52.40 .21	43.8 0.7	59.82 .75	45.5 0.9
16.2	29.63 .15	62.1 0.8	36.38 .58	65.8 1.5	52.20 .19	43.0 1.1	59.08 .71	44.3 1.4
26.1	29.49 −.12	61.2 −1.0	35.82 −.52	64.0 −2.0	52.02 −.16	41.7 −1.4	58.40 −.65	42.6 −1.9
Nov. 5.1	29.38 .09	60.0 1.3	35.34 .45	61.8 2.5	51.88 .12	40.1 1.8	57.80 .56	40.4 2.4
15.1	29.32 −.04	58.5 1.6	34.93 .36	59.1 2.8	51.78 .08	38.1 2.1	57.28 .46	37.8 2.8
25.1	29.30 .00	56.8 1.8	34.62 .26	56.1 3.2	51.72 −.03	35.9 2.4	56.88 .34	34.9 3.1
Dec. 5.0	29.33 +.05	54.9 −2.0	34.42 −.15	52.8 −3.4	51.72 +.02	33.8 −2.6	56.60 −.21	31.6 −3.4
15.0	29.40 .10	52.9 2.1	34.33 −.03	49.3 3.6	51.76 .07	30.6 2.8	56.46 −.08	28.1 3.5
25.0	29.52 .14	50.7 2.2	34.36 +.09	45.7 3.6	51.86 .12	27.8 2.8	56 45 +.07	24.5 3.6
34.9	29.68 +.18	48.5 −2.2	34.51 +.21	42.1 −3.5	52.00 +.17	25.0 −2.8	56.50 +.23	21.0 −3.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Draconis.		γ^2 Sagittarii.		μ Sagittarii.		η Serpentis.	
	Right Ascension.	**Declination** *North.*	**Right Ascension.**	**Declination** *South.*	**Right Ascension.**	**Declination** *South.*	**Right Ascension.**	**Declination** *South.*
	h m 17 53	° ′ +51 29	h m 17 58	° ′ −30 25	h m 18 6	° ′ −21 5	h m 18 15	° ′ −2 55
	s	″	s	″	s	″	s	″
Jan. 0.0	50.29 +.13	71.4 −3.5	13.39 +.19	21.8 +0.4	42.14 +.16	13.9 −0.1	11.94 +.14	37.9 −1.2
9.9	50.45 .19	68.0 3 3	13.60 .23	21.4 0.3	42.32 .20	14.0 0.2	12.09 .17	39.1 1.2
19.9	50.67 .25	64.8 3.1	13.85 .26	21.1 0.3	42.54 .23	14.2 0.2	12.28 .20	40.3 1.1
29.9	50.94 .30	61.8 2.7	14.12 .29	20.9 0.2	42.79 .26	14.4 0.2	12.50 .23	41.4 1.0
Feb. 8.9	51.26 .34	59.3 2.3	14.42 .31	20.7 0 1	43.07 .28	14.5 0.2	12.74 .25	42.4 0.9
18.8	51.62 +.37	57.3 −1.7	14.74 +.33	20.6 +0.1	43.36 +.30	14.7 −0.1	13.01 +.27	43.2 −0.7
28.8	52.00 .39	55.9 1.1	15.08 .34	20.5 0.1	43.66 .31	14.8 −0.1	13.28 .28	43.8 0.4
Mar. 10.8	52.40 .40	55.1 −0.5	15.41 .34	20.4 +0.1	43.97 .31	14.8 0.0	13.56 .29	44.1 −0.2
20.8	52.80 .40	55.0 +0.2	15.75 .34	20.4 0.0	44.28 .31	14.7 +0.1	13.85 .29	44.1 +0.1
30.7	53.19 .39	55.5 0.8	16.09 .33	20.3 0.0	44.60 .31	14.5 0.2	14.14 .29	43.8 0.4
Apr. 9.7	53.58 +.37	56.6 +1.4	16.42 +.33	20.3 0.0	44.91 +.31	14.2 +0.3	14.42 +.28	43.3 +0.6
19.7	53.94 .35	58.3 2.0	16.74 .31	20.3 0.0	45.21 .29	13.9 0.3	14.70 .27	42.6 0.9
29.6	54.27 .31	60.5 2.4	17.05 .30	20.3 0.0	45.49 .28	13.6 0.4	14.97 .26	41.6 1.1
May 9.6	54.56 .27	63.2 2.8	17.33 .27	20.3 −0.1	45.76 .26	13.2 0.4	15.22 .24	40.5 1.2
19.6	54.80 .22	66.1 3.1	17.59 .25	20.4 0.1	46.01 .24	12.8 0.4	15.45 .22	39.2 1 3
29.6	55.00 +.17	69.3 +3.3	17.83 +.22	20.6 −0.2	46.24 +.21	12.4 +0.4	15.66 +.19	37.9 +1.3
June 8.5	55.14 .11	72.6 3.4	18.02 .18	20.8 0.3	46.43 .17	12.0 0.3	15.84 .16	36.5 1.3
18.5	55.22 +.05	76.0 3.3	18.18 .14	21.2 0.3	46.58 .14	11.7 0.2	15.98 .13	35.2 1.3
28.5	55.24 −.01	79.3 3.3	18.30 .09	21.5 0.4	46.70 .09	11.5 0.2	16.09 .09	33.9 1.2
July 8.4	55.20 .07	82.5 3.1	18.37 +.05	21.9 0.4	46.77 .05	11.4 0.1	16.16 .05	32.8 1.1
18.4	55.10 −.13	85.4 +2.8	18.39 .00	22.4 −0.4	46.80 +.01	11.3 +0.1	16.18 +.01	31.7 +1.0
28.4	54.95 .18	88.1 2.5	18.37 −.05	22.8 0.4	46.78 −.04	11.3 0.0	16.17 −.03	30.7 0.9
Aug. 7.4	54.74 .23	90.4 2.1	18.30 .09	23.2 0.4	46.73 .08	11.3 0.0	16.11 .07	29.9 0.7
17.3	54.49 .27	92.4 1.7	18.18 .13	23.6 0.3	46.63 .12	11.3 0.0	16.02 .11	29.3 0.6
27.3	54.20 .31	93.9 1.3	18.03 .16	23.9 0.2	46.50 .15	11.3 0.0	15.90 .14	28.7 0.4
Sept. 6.3	53.88 −.33	94.9 +0.8	17.86 −.19	24.1 −0.1	46.34 −.17	11.4 0.0	15.74 −.16	28.4 +0 3
16.3	53.53 .35	95.5 +0.3	17.66 .20	24.2 0.0	46.16 .19	11.4 0.0	15.58 .18	28.1 +0.2
26.2	53.18 .35	95.5 −0.2	17.46 .20	24.1 +0.1	45.97 .19	11.3 +0.1	15.39 .18	28.1 0.0
Oct. 6.2	52.84 .34	95.0 0.7	17.26 .20	23.9 0.3	45.78 .18	11.2 0.1	15.22 .17	28.1 −0.1
16.2	52.51 .32	94.1 1.2	17.07 .18	23.6 0.4	45.61 .16	11.1 0.1	15.04 .16	28.4 0.3
26.1	52.21 −.28	92.6 −1.7	16.91 −.14	23.1 +0.5	45.46 −.13	10.9 +0.1	14.90 −.14	28.7 −0.4
Nov. 5.1	51.95 .24	90.7 2.2	16.79 .10	22.6 0.6	45.34 .10	10.8 0.1	14.77 .11	29.2 0.6
15.1	51.74 .18	88.3 2.6	16.71 −.06	22.0 0.6	45.26 .06	10.7 0.1	14.69 .07	29.9 0.8
25.1	51.58 .12	85.5 2.9	16.68 .00	21.4 0.6	45.22 −.01	10.6 +0.1	14.64 −.02	30.7 0.9
Dec. 5.0	51.50 −.06	82.4 −3.2	16.70 +.05	20.8 +0.6	45.24 +.04	10.5 0.0	14.64 +.02	31.7 −1.0
15.0	51.48 +.01	79.1 3.4	16.78 .10	20.3 0.5	45.30 .09	10.5 0.0	14.68 .07	32.8 1.1
25.0	51.53 .08	75.7 3.5	16.91 .15	19.8 0.5	45.41 .13	10.6 −0.1	14.77 .11	33.9 1.2
35.0	51.64 +.15	72.2 −3.5	17.08 +.20	19.3 +0.4	45.57 +.17	10.7 −0.1	14.90 +.15	35.1 −1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Octantis.		1 Aquilæ.		α Lyræ. (*Vega.*)		β Lyræ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h 18	° ′ -89 16	h m 18 28	° ′ -8 19	h m 18 32	° ′ +38 40	h m 18 45	° ′ +33 13
	m s	″	s	″	s	″	s	″
Jan. 0.0	26 52.9 + 5.4	20.0 +3.4	46.85 +.13	27.9 −0.8	55.57 +.06	31.6 −3.1	42.57 +.06	39.3 −2.9
10.0	26 59.7 8.3	16.7 3.3	47.00 .17	28.8 0.8	55.68 .14	28.6 3.0	42.67 .12	36.4 2.9
19.9	27 9.5 11.2	13.5 3.1	47.19 .20	29.6 0.8	55.84 .18	25.6 2.9	42.81 .16	33.6 2.7
29.9	27 22.0 13.8	10.6 2.8	47.40 .23	30.4 0.7	56.04 .22	22.8 2.6	43.00 .20	30.9 2.5
Feb. 8.9	27 36.9 15.9	8.0 2.4	47.64 .25	31.1 0.6	56.28 .26	20.3 2.3	43.22 .24	28.6 2.1
18.8	27 53.7 +17.6	5.9 +1.9	47.90 +.27	31.6 −0.4	56.56 +.29	18.3 −1.8	43.47 +.27	26.6 −1.8
28.8	28 11.9 18.8	4.2 1.5	48.17 .28	31.9 −0.2	56.86 .31	16.7 1.3	43.75 .29	25.0 1.3
Mar. 10.8	28 31.2 19.7	3.0 1.0	48.46 .29	32.1 0.0	57.18 .33	15.7 0.7	44.04 .30	24.0 0.8
20.8	28 51.1 20.1	2.2 +0.5	48.74 .29	32.0 +0.2	57.51 .33	15.2 −0.1	44.36 .31	23.5 −0.2
30.7	29 11.2 20.0	1.9 0.0	49.04 .29	31.7 0.4	57.85 .34	15.4 +0.5	44.67 .32	23.6 +0.4
Apr. 9.7	29 31.0 +19.6	2.1 −0.5	49.33 +.29	31.2 +0.6	58.18 +.33	16.2 +1.0	44.99 +.32	24.3 +0.9
19.7	29 50.2 18.7	2.8 0.9	49.62 .28	30.5 0.8	58.51 .32	17.5 1.6	45.31 .31	25.4 1.4
29.7	30 8.3 17.5	3.9 1.3	49.90 .27	29.6 0.9	58.81 .30	19.3 2.0	45.61 .29	27.1 1.9
May 9.6	30 25.0 15.9	5.5 1.7	50.16 .26	28.6 1.0	59.10 .27	21.5 2.4	45.90 .27	29.2 2.2
19.6	30 39.9 13.9	7.4 2.1	50.41 .24	27.6 1.1	59.36 .24	24.1 2.7	46.15 .25	31.6 2.6
29.6	30 52.7 +11.7	9.7 −2.4	50.63 +.21	26.4 +1.1	59.58 +.21	27.0 +3.0	46.38 +.21	34.3 +2.8
June 8.5	31 3.2 9.2	12.3 2.7	50.83 .18	25.3 1.1	59.77 .16	30.0 3.1	46.58 .18	37.2 2.9
18.5	31 11.1 6.4	15.1 2.9	50.99 .14	24.2 1.1	59.91 .12	33.2 3.1	46.74 .13	40.2 3.0
28.5	31 16.0 3.5	18.0 3.0	51.11 .11	23.2 1.0	60.00 .07	36.3 3.1	46.85 .09	43.2 3.0
July 8.5	31 18.0 + 0.5	21.0 3.0	51.20 .06	22.3 0.9	60.05 +.02	39.4 3 0	46.91 +.04	46.1 2.9
18.4	31 17.0 − 2.5	23.9 −2.9	51.24 +.02	21.5 +0.8	60.04 −.03	42.3 +2.8	46.93 −.01	49.0 +2.7
28.4	31 13.0 5.5	26.8 2.8	51.24 −.02	20.8 0.6	59.99 .08	45.0 2.6	46.90 .05	51.6 2.5
Aug. 7.4	31 6.1 8.3	29.5 2.5	51.20 .06	20.2 0.5	59.88 .13	47.5 2.3	46.82 .10	54.0 2.2
17.4	30 56.4 10.9	31.9 2.1	51.12 .10	19.7 0.4	59.73 .17	49.6 2.0	46.70 .14	56.0 1.9
27.3	30 44.3 13.1	33.8 1.7	51.00 .13	19.4 0.3	59.54 .20	51.4 1.6	46.54 .18	57.8 1.6
Sept. 6.3	30 30.3 −14.8	35.3 −1.2	50.86 −.15	19.1 +0.2	59.32 −.23	52.7 +1.2	46.34 −.20	59.2 +1.2
16.3	30 14.9 16.0	36.3 0.7	50.69 .17	19.0 +0.1	59.08 .25	53.7 0.7	46.13 .23	60.1 0.8
26.2	29 58.5 16.6	36.7 −0.1	50.52 .18	18.9 0.0	58.82 .26	54.2 +0.3	45.90 .24	60.7 +0.4
Oct. 6.2	29 41.8 16.6	36.5 +0.5	50.34 .18	18.9 −0.1	58.56 .26	54.2 −0.2	45.66 .24	60.8 −0.1
16.2	29 25.5 15.9	35.8 1.1	50.17 .16	19.1 0.2	58.30 .25	53.8 0.7	45.42 .23	60.5 0.5
26.2	29 10.2 −14.5	34.4 +1.7	50.01 −.14	19.3 −0.3	58.06 −.22	52.9 −1.1	45.20 −.21	59.8 −1.0
Nov. 5.1	28 56.6 12.5	32.4 2.2	49.89 .11	19.6 0.4	57.85 .19	51.5 1.6	45.01 .18	58.6 1.4
15.1	28 45.3 10.0	30.0 2.6	49.79 .07	20.0 0.5	57.68 .15	49.7 2.0	44.84 .14	57.0 1.8
25.1	28 36.7 7.1	27.2 3.0	49.74 −.03	20.6 0.6	57.55 .11	47.5 2.4	44.72 .10	55.0 2.1
Dec. 5.1	28 31.1 − 4.0	24.0 +3.3	49.73 +.01	21.2 −0.7	57.46 −.06	45.0 −2.7	44.64 −.06	52.7 −2.4
15.0	28 28.8 − 0.6	20.7 3.4	49.77 .06	21.9 0.8	57.43 .00	42.2 2.9	44.61 −.01	50.2 2.7
25.0	28 30.0 + 2.9	17.3 3.5	49.85 .10	22.7 0.8	57.46 +.05	39.2 3.1	44.63 +.04	47.4 2.8
35.0	28 34.7 + 6.3	13.8 +3.5	49.97 +.14	23.6 −0.9	57.53 +.11	36.1 −3.1	44.70 +.09	44.5 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii		50 Draconis.		ζ Aquilæ.		d Sagittarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	18h 47m	−26° 26′	18h 50m	+75° 17′	18h 59m	+13° 41′	19h 10m	−19° 9′
	s	″	s	″	s	″	s	″
Jan. 0.0	56.58 +.13	27.0 +0.4	4.56 −.09	44.8 −3.4	58.74 +.08	25.2 −2.0	43.53 +.10	38.2 0.0
10.0	56.72 .17	26.6 0.4	4.56 +.07	41.4 3.4	58.84 .12	23.2 2.0	43.65 .13	38.2 0.0
20.0	56.91 .20	26.2 0.3	4.72 .24	38.0 3.3	58.98 .16	21.2 1.9	43.80 .17	38.2 0.0
29.9	57.13 .24	25.9 0.3	5.04 .40	34.7 3.1	59.15 .19	19.4 1.7	43.99 .20	38.2 0.0
Feb. 8.9	57.38 .26	25.6 0.3	5.51 .54	31.7 2.7	59.36 .21	17.8 1.5	44.20 .23	38.1 +0.1
18.9	57.66 +.28	25.2 +0.4	6.12 +.66	29.2 −2.3	59.58 +.24	16.4 −1.2	44.45 +.25	38.0 +0.2
28.8	57.95 .30	24.8 0.4	6.83 .76	27.1 1.8	59.83 .26	15.4 0.8	44.71 .27	37.7 0.3
Mar. 10.8	58.26 .31	24.4 0.4	7.64 .84	25.6 1.2	60.10 .27	14.7 −0.4	44.99 .29	37.3 0.4
20.8	58.58 .32	24.0 0.5	8.50 .88	24.7 −0.5	60.37 .28	14.5 0.0	45.28 .30	36.9 0.5
30.8	58.90 .32	23.5 0.5	9.39 .89	24.5 +0.1	60.66 .29	14.7 +0.4	45.59 .31	36.3 0.6
Apr. 9.7	59.22 +.32	23.0 +0.5	10.28 +.87	25.0 +0.8	60.95 +.29	15.3 +0.8	45.90 +.31	35.6 +0.7
19.7	59.55 .32	22.4 0.5	11.13 .82	26.1 1.4	61.24 .29	16.3 1.2	46.20 .31	34.8 0.8
29.7	59.87 .31	21.9 0.5	11.93 .76	27.7 1.9	61.52 .28	17.6 1.5	46.51 .30	34.0 0.8
May 9.7	60.17 .30	21.4 0.5	12.65 .66	29.9 2.4	61.80 .26	19.3 1.8	46.81 .29	33.1 0.8
19.6	60.46 .28	21.0 0.4	13.27 .55	32.6 2.8	62.05 .24	21.2 2.0	47.10 .28	32.2 0.8
29.6	60.72 +.25	20.7 +0.3	13.76 +.43	35.6 +3.1	62.29 +.21	23.4 +2.2	47.36 +.26	31.4 +0.8
June 8.6	60.96 .22	20.4 0.1	14.13 .30	38.8 3.4	62.49 .19	25.6 2.3	47.60 .23	30.7 0.7
18.5	61.16 .18	20.3 +0.1	14.36 +.15	42.3 3.5	62.67 .16	27.8 2.3	47.82 .19	30.0 0.6
28.5	61.32 .14	20.2 −0.1	14.44 .00	45.8 3.5	62.80 .12	30.1 2.2	47.99 .15	29.5 0.5
July 8.5	61.44 .09	20.3 0.1	14.36 −.14	49.3 3.4	62.90 .08	32.3 2.1	48.12 .11	29.0 0.4
18.5	61.51 +.04	20.5 −0.2	14.15 −.29	52.7 +3.3	62.96 +.03	34.4 +2.0	48.21 +.06	28 8 +0.2
28.4	61.53 −.02	20.7 0.3	13.79 .42	55.9 3.1	62.97 −.01	36.2 1.8	48.25 +.02	28.6 +0.1
Aug. 7.4	61.50 .05	21.0 0.3	13.30 .55	58.9 2.8	62.94 .05	38.0 1.6	48.25 −.03	28.5 0.0
17.4	61.43 .09	21.4 0.3	12.69 .66	61.5 2.5	62.86 .09	39.4 1.3	48.20 .07	28.5 −0.1
27.4	61.32 .13	21.8 0.3	11.98 .76	63.8 2.1	62.75 .13	40.7 1.1	48.11 .11	28.6 0.1
Sept. 6.3	61.17 −.16	22.1 −0.3	11.17 −.84	65.7 +1.6	62.61 −.15	41.6 +0.8	47.98 −.14	28.8 −0.2
16.3	61.00 .18	22.3 0.2	10.30 .90	67.1 1.2	62.44 .17	42.3 0.6	47.82 .16	29.0 0.2
26.3	60.81 .19	22.5 −0.1	9.39 .94	68.1 0.7	62.26 .19	42.7 +0.3	47.65 .18	29.1 0.2
Oct. 6.2	60.61 .20	22.6 0.0	8.45 .94	68.5 +0.1	62.07 .19	42.8 0.0	47.47 .18	29.3 0.2
16.2	60.42 .18	22.6 0.0	7.51 .92	68.4 −0.4	61.88 .18	42.7 −0.3	47.28 .18	29.4 0.1
26.2	60.25 −.16	22 5 +0.1	6.60 −.88	67.7 −0.9	61.71 −.17	42.2 −0.6	47.11 −.17	29.6 −0.1
Nov. 5.2	60.10 .13	22.3 0.2	5.73 .82	66.5 1.5	61.55 .14	41.4 0.9	46.96 .14	29.6 0.1
15.1	59.99 .09	22.1 0.3	4.95 .73	64.8 2.0	61.43 .11	40.3 1.2	46.84 .10	29.7 0.1
25.1	59.91 .05	21.8 0.3	4.26 .62	62.6 2.4	61.34 .07	39.0 1.4	46.76 .06	29.8 0.1
Dec. 5.1	59.89 −.01	21.4 +0.4	3.70 −.49	60.0 −2.8	61.28 −.03	37.4 −1.7	46.72 −.02	29.8 −0.1
15.1	59.91 +.05	21.1 0.4	3.27 .34	57.0 3.1	61.27 +.01	35.6 1.9	46.72 +.02	29.9 0.1
25.0	59.98 .10	20.7 0.4	3.00 .19	53.7 3.3	61.30 .05	33.7 1.9	46.76 .06	29.9 0.1
35.0	60.10 +.14	20.4 +0.4	2.90 −.02	50.3 −3.4	61.38 +.09	31.8 −2.0	46.85 +.11	30.0 −0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.		τ Draconis.		δ Aquilæ.		κ Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 12	° ′ +67 27	h m 19 17	° ′ +73 7	h m 19 19	° ′ +2 52	h m 19 30	° ′ −7 17
	s	″	s	″	s	″	s	″
Jan. 0.0	28.19 −.07	22.5 −3.3	44.26 −.14	78.6 −3.3	32.59 +.07	54.8 −1.4	32.29 +.07	14.9 −0.7
10.0	28.18 +.04	19.1 3.4	44.19 .00	75.2 3.4	32.68 .11	53.4 1.3	32.38 .10	15.6 0.7
20.0	28.27 .15	15.6 3.4	44.26 +.14	71.8 3.4	32.80 .14	52.1 1.3	32.50 .14	16.3 0.6
29.9	28.47 .25	12.3 3.3	44.47 .28	68.4 3.3	32.96 .17	50.9 1.2	32.65 .17	16.9 0.6
Feb. 8.9	28.76 .34	9.2 2.9	44.81 .41	65.3 3.0	33.15 .20	49.8 1.0	32.84 .20	17.4 0.4
18.9	29.15 +.43	6.5 −2.5	45.28 +.52	62.5 −2.6	33.36 +.23	48.9 −0.8	33.05 +.22	17.8 −0.3
28.9	29.62 .50	4.2 2.0	45.86 .62	60.2 2.1	33.60 .24	48.3 0.5	33.28 .24	17.9 −0.1
Mar. 10.8	30.15 .55	2.5 1.4	46.52 .70	58.4 1.5	33.85 .26	48.0 −0.2	33.54 .26	17.9 +0.2
20.8	30.72 .59	1.4 0.8	47.25 .75	57.2 0.9	34.12 .27	48.0 +0.1	33.81 .27	17.6 0.4
30.8	31.32 .61	0.9 −0.1	48.02 .78	56.6 −0.2	34.40 .28	48.3 0.5	34.09 .29	17.1 0.6
Apr. 9.7	31.94 +.61	1.2 +0.5	48.81 +.79	56.7 +0.4	34.69 +.29	48.9 +0.8	34.38 +.29	16.4 +0.8
19.7	32.54 .59	2.0 1.2	49.59 .77	57.4 1.1	34.98 .29	49.9 1.1	34.67 .29	15.4 1.0
29.7	33.12 .56	3.5 1.7	50.33 .72	58.8 1.7	35.27 .28	51.1 1.3	34.97 .29	14.3 1.2
May 9.7	33.66 .51	5.5 2.3	51.02 .65	60.7 2.2	35.55 .28	52.5 1.6	35.26 .28	13.1 1.3
19.6	34.14 .45	8.0 2.7	51.64 .57	63.2 2.6	35.82 .26	54.2 1.7	35.54 .27	11.7 1.4
29.6	34.55 +.37	10.9 +3.1	52.16 +.47	66.0 +3.1	36.07 +.24	55.9 +1.8	35.80 +.25	10.3 +1.4
June 8.6	34.88 .29	14.1 3.3	52.58 .36	69.1 3.3	36.29 .21	57.7 1.8	36.04 .23	9.0 1.4
18.6	35.12 .20	17.6 3.5	52.87 .23	72.5 3.5	36.49 .18	59.5 1.8	36.26 .20	7.6 1.3
28.5	35.27 +.10	21.1 3.6	53.04 +.11	76.0 3.6	36.65 .14	61.3 1.7	36.43 .16	6.3 1.2
July 8.5	35.32 .00	24.7 3.6	53.09 −.02	79.6 3.6	36.78 .10	63.0 1.6	36.57 .12	5.1 1.1
18.5	35.27 −.10	28.2 +3.4	53.00 −.15	83.2 +3.5	36.86 +.06	64.6 +1.5	36.67 +.08	4.1 +0.9
28.4	35.12 .20	31.6 3.3	52.78 .28	86.6 3.3	36.90 +.01	66.0 1.3	36.73 +.03	3.2 0.8
Aug. 7.4	34.88 .29	34.8 3.0	52.45 .39	89.8 3.1	36.89 −.03	67.3 1.1	36.74 −.01	2.5 0.6
17.4	34.55 .37	37.7 2.7	52.00 .50	92.8 2.8	36.84 .07	68.4 0.9	36.70 .05	1.9 0.5
27.4	34.14 .44	40.2 2.4	51.44 .60	95.4 2.4	36.76 .10	69.2 0.8	36.63 .09	1.4 0.3
Sept. 6.3	33.66 −.50	42.4 +1.9	50.81 −.68	97.6 +2.0	36.64 −.13	69.9 +0.6	36.52 −.13	1.2 +0.2
16.3	33.13 .55	44.1 1.5	50.10 .74	99.4 1.6	36.49 .16	70.4 0.4	36.38 .15	1.0 +0.1
26.3	32.57 .58	45.4 1.0	49.33 .78	100.8 1.1	36.32 .17	70.6 +0.2	36.22 .17	1.0 −0.1
Oct. 6.3	31.98 .60	46.1 +0.5	48.54 .81	101.6 +0.6	36.15 .18	70.7 0.0	36.04 .17	1.0 0.1
16.2	31.38 .59	46.3 −0.1	47.73 .81	102.0 0.0	35.97 .17	70.6 −0.2	35.87 .17	1.2 0.2
26.2	30.79 −.57	45.9 −0.6	46.93 −.79	101.7 −0.5	35.81 −.16	70.3 −0.4	35.71 −.16	1.5 −0.3
Nov. 5.2	30.24 .54	45.0 1.2	46.16 .74	100.9 1.1	35.66 .14	69.7 0.6	35.55 .14	1.8 0.4
15.1	29.72 .48	43.5 1.7	45.45 .68	99.6 1.6	35.53 .11	69.0 0.8	35.43 .11	2.3 0.5
25.1	29.27 .41	41.5 2.2	44.81 .59	97.7 2.1	35.44 .07	68.2 1.0	35.33 .07	2.8 0.6
Dec. 5.1	28.90 −.33	39.1 −2.6	44.27 −.49	95.4 −2.5	35.38 −.03	67.1 −1.1	35.28 −.03	3.4 −0.6
15.1	28.61 .24	36.2 3.0	43.84 .37	92.6 2.9	35.37 +.01	65.9 1.2	35.26 +.01	4.0 0.7
25.0	28.43 .13	33.1 3.3	43.54 .24	89.5 3.2	35.39 .04	64.6 1.3	35.28 .04	4.8 0.7
35.0	28.35 −.03	29.7 −3.6	43.37 −.10	86.2 −3.4	35.46 +.08	63.3 −1.3	35.34 +.07	5.5 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquilæ.		α Aquilæ. (*Altair.*)		ε Draconis.		β Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 40	+10° 19′	h m 19 45	+8° 33′	h m 19 48	+69° 57′	h m 19 49	+6° 6′
	s	″	s	″	s	″	s	″
Jan. 0.0	38.62 +.05	41.8 −1.7	1.22 +.05	33.3 −1.6	30.37 −.18	74.5 −3.1	30.71 +.04	52.4 −1.4
10.0	38.69 .08	40.2 1.7	1.28 .08	31.7 1.6	30.24 −.07	71.3 3.4	30.77 .08	50.9 1.4
20.0	38.79 .12	38.5 1.7	1.38 .12	30.2 1.5	30.24 +.05	67.9 3.4	30.86 .11	49.5 1.4
30.0	38.92 .15	36.9 1.5	1.51 .15	28.7 1.4	30.35 .17	64.5 3.3	30.99 .14	48.1 1.3
Feb. 8.9	39.09 .18	35.4 1.3	1.68 .18	27.4 1.2	30.58 .29	61.2 3.1	31.15 .17	46.9 1.1
18.9	39.28 +.21	34.2 −1.1	1.87 +.21	26.3 −1.0	30.92 +.39	58.3 −2.8	31.34 +.20	45.9 −0.9
28.9	39.50 .23	33.3 0.8	2.09 .23	25.4 0.6	31.35 .48	55.7 2.4	31.55 .22	45.2 0.6
Mar. 10.9	39.74 .25	32.7 0.4	2.33 .25	24.9 −0.3	31.87 .56	53.6 1.8	31.79 .24	44.7 −0.3
20.8	40.00 .27	32.5 −0.1	2.58 .27	24.8 0.0	32.46 .62	52.1 1.2	32.04 .26	44.6 +0.1
30.8	40.28 .28	32.7 +0.4	2.86 .28	25.0 +0.4	33.11 .66	51.1 −0.6	32.31 .28	44.9 0.4
Apr. 9.8	40.56 +.29	33.3 +0.8	3.14 +.29	25.6 +0.8	33.78 +.68	50.9 +0.1	32.59 +.29	45.5 +0.8
19.7	40.85 .29	34.2 1.1	3.43 .29	26.5 1.1	34.46 .68	51.2 0.7	32.88 .29	46.4 1.1
29.7	41.14 .29	35.5 1.4	3.72 .29	27.8 1.4	35.12 .66	52.3 1.3	33.17 .29	47.6 1.4
May 9.7	41.43 .28	37.0 1.7	4.02 .29	29.4 1.7	35.76 .61	53.9 1.9	33.46 .29	49.1 1.6
19.7	41.71 .27	38.9 1.9	4.30 .27	31.2 1.9	36.35 .56	56.0 2.4	33.74 .28	50.8 1.8
29.6	41.97 +.25	40.9 +2.1	4.56 +.25	33.1 +2.0	36.87 +.48	58.6 +2.8	34.01 +.26	52.7 +1.9
June 8.6	42.21 .22	43.0 2.2	4.80 .23	35.2 2.1	37.31 .40	61.6 3.1	34.26 .23	54.7 2.0
18.6	42.42 .19	45.2 2.2	5.02 .20	37.3 2.1	37.66 .30	64.9 3.5	34.48 .20	56.7 2.0
28.6	42.59 .16	47.4 2.2	5.20 .16	39.4 2.1	37.91 .19	68.4 3.6	34.66 .17	58.7 2.0
July 8.5	42.73 .12	49.5 2.1	5.34 .12	41.5 2.0	38.05 +.09	72.0 3.6	34.81 .13	60.6 1.9
18.5	42.83 +.07	51.5 +1.9	5.44 +.08	43.4 +1.9	38.08 −.02	75.6 +3.6	34.92 +.08	62.4 +1.7
28.5	42.88 +.03	53.4 1.8	5.50 +.04	45.2 1.7	38.00 .13	79.2 3.5	34.98 +.04	64.1 1.5
Aug. 7.4	42.89 −.01	55.1 1.6	5.52 −.01	46.9 1.5	37.81 .23	82.6 3.3	35.00 .00	65.6 1.4
17.4	42.85 .06	56.5 1.4	5.49 .05	48.3 1.3	37.53 .33	85.8 3.1	34.97 −.05	66.8 1.2
27.4	42.77 .09	57.8 1.1	5.42 .09	49.5 1.1	37.14 .43	88.7 2.8	34.90 .09	67.9 1.0
Sept. 6.4	42.66 −.13	58.8 +0.9	5.31 −.12	50.4 +0.8	36.67 −.50	91.3 +2.4	34.80 −.12	68.8 +0.7
16.3	42.52 .15	59.6 0.6	5.17 .15	51.2 0.6	36.14 .57	93.5 2.0	34.67 .14	69.4 0.5
26.3	42.36 .18	60.1 0.4	5.01 .17	51.7 0.3	35.54 .62	95.3 1.5	34.52 .16	69.8 0.3
Oct. 6.3	42.18 .18	60.3 +0.1	4.84 .18	51.9 +0.1	34.91 .65	96.6 1.0	34.34 .17	70.0 +0.1
16.3	42.00 .18	60.3 −0.2	4.66 .18	51.9 −0.1	34.25 .66	97.3 +0.5	34.17 .17	69.9 −0.2
26.2	41.82 −.17	60.0 −0.4	4.49 −.17	51.6 −0.4	33.59 −.66	97.5 −0.1	34.00 −.17	69.7 −0.4
Nov. 5.2	41.66 .15	59.4 0.7	4.33 .15	51.1 0.6	32.94 .63	97.2 0.6	33.84 .15	69.2 0.6
15.2	41.52 .12	58.6 0.9	4.20 .12	50.4 0.9	32.33 .58	96.3 1.2	33.70 .11	68.4 0.8
25.2	41.42 .09	57.6 1.1	4.08 .09	49.4 1.1	31.77 .53	94.8 1.7	33.59 .09	67.5 1.0
Dec. 5.1	41.34 −.06	56.4 −1.3	4.01 −.06	48.2 −1.3	31.28 −.45	92.8 −2.2	33.52 −.06	66.4 −1.2
15.1	41.30 −.02	54.9 1.5	3.97 −.02	46.9 1.4	30.87 .37	90.3 2.7	33.47 −.02	65.2 1.3
25.1	41.30 +.02	53.3 1.6	3.97 +.02	45.4 1.5	30.57 .26	87.5 3.0	33.47 +.01	63.8 1.4
35.0	41.34 +.06	51.6 −1.7	4.00 +.06	43.8 −1.6	30.37 −.14	84.3 −3.3	33.50 +.05	62.4 −1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ.		α² Capricorni.		κ Cephei.		α Pavonis.	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.
	h m 19 58	° ′ +6 56	h m 20 11	° ′ -12 54	h m 20 12	° ′ +77 21	h m 20 16	° ′ -57 6
	s	″	s	″	s	″	s	″
Jan. 0.1	22.26 +.03	51.0 -1.4	30.21 + 03	30.6 -0 3	44.64 -.45	34.2 -2.9	17.76 +.01	42.2 +2.3
10.0	22.31 .07	49.6 1.4	30.26 .07	30.9 0.3	44.28 .27	31.2 3.2	17.80 .08	39.8 2.4
20.0	22.40 .10	48.1 1.4	30.34 .10	31.1 0.2	44.11 -.08	27.9 3.3	17.91 .14	37.4 2.4
30.0	22.52 .13	46.8 1.3	30.46 14	31.3 -0.1	44.12 +.11	24.6 3.3	18.09 .21	35.0 2.5
Feb. 9.0	22.67 .16	45.5 1.1	30.61 .17	31.3 0.0	44.33 .30	21.3 3.2	18.32 .26	32.5 2.4
18.9	22.85 +.19	44.5 -0.9	30.79 +.19	31.2 +0.2	44.72 +.48	18.2 -3.0	18.62 +.31	30.1 +2.4
28.9	23.05 .22	43.7 0.6	31.00 .22	31.0 0.3	45.28 .64	15.4 2.6	18.96 .36	27.8 2.3
Mar. 10.9	23.28 .24	43.3 -0.3	31.23 .24	30.6 0.5	45.98 .77	13.0 2.1	19.34 .41	25.6 2.1
20.8	23.53 .26	43.2 0.0	31.48 .26	29.9 0.7	46.82 .89	11.2 1.6	19.77 .44	23.6 1.9
30.8	23.80 .27	43.4 +0.4	31.75 .28	29.2 0.9	47.75 .97	9.9 1.0	20.22 .47	21.8 1.7
Apr. 9.8	24.08 +.29	44.0 +0.8	32.04 +.30	28.2 +1.0	48.74+1.01	9.2 -0.3	20.70 +.49	20.3 +1.4
19.8	24.37 .29	44.9 1.1	32.34 .30	27.1 1.2	49.77 1.03	9.2 +0.3	21.20 .50	19.0 1.1
29.7	24.66 .29	46.2 1.4	32.64 .30	25.8 1.3	50.79 1.01	9.8 0.9	21.71 .51	18.1 0.8
May 9.7	24.95 .29	47.7 1.6	32.94 .30	24.5 1.3	51.77 .96	11.0 1.5	22.21 .50	17.4 0.5
19.7	25.24 .28	49.4 1.8	33.24 .30	23.2 1.4	52.70 .88	12.8 2.0	22.71 .49	17.1 +0.1
29.7	25.51 +.26	51.3 +2.0	33.54 +.28	21.8 +1.4	53.52 +.77	15.1 +2.5	23.19 +.46	17.2 -0.3
June 8.6	25.76 .23	53.4 2.0	33.81 .26	20.5 1.3	54.23 .65	17.8 2 9	23.64 .43	17.6 0.6
18.6	25.98 .21	55.4 2.1	34.06 .23	19.3 1.2	54.81 .50	20.8 3.2	24.05 .38	18.4 0.9
28.6	26.18 .17	57.5 2.0	34.27 .20	18.1 1.0	55.24 .34	24.2 3.4	24.40 .32	19.5 1.2
July 8.5	26.33 .13	59.5 1.9	34 45 .16	17.2 0.9	55.50 .18	27.7 3.6	24.70 .26	20.8 1.5
18.5	26.44 +.09	61.4 +1.8	34.59 +.12	16.3 +0.7	55.59 +.01	31.3 +3.6	24.92 +.19	22.5 -1.7
28.5	26.52 +.05	63.1 1.6	34.69 .07	15.7 0.5	55.52 -.16	34.9 3.6	25.07 .11	24.3 1.9
Aug. 7.5	26.54 .00	64.7 1.5	34.74 +.03	15.2 0.4	55.28 .32	38.4 3.5	25.14 +.03	26.2 2.0
17.4	26.52 -.04	66.1 1.3	34.74 -.01	14.9 0.2	54.88 .47	41.8 3.3	25.13 -.05	28.2 2.0
27.4	26.46 .08	67.2 1.0	34.70 .06	14.7 +0.1	54.34 .62	45.0 3.0	25.04 .12	30.1 1.9
Sept. 6.4	26.37 -.11	68.1 +0.8	34.62 -.10	14.7 0.0	53.65 -.74	47.9 +2.7	24.88 -.19	32.0 -1.8
16.4	26.24 .14	68.8 0.6	34.50 .13	14.8 -0.1	52.85 .85	50.5 2.4	24.66 .25	33.7 1.6
26.3	26.09 .16	69.3 0.3	34.36 .15	14.9 0.2	51.96 .94	52.6 1.9	24.39 .29	35.1 1.3
Oct. 6.3	25.92 .17	69.5 +0.1	34.20 .17	15.2 0.3	50.98 1.00	54.3 1.5	24.08 .32	36.2 0.9
16.3	25.75 .17	69.5 -0.1	34.03 .17	15.4 0.3	49.95 1.05	55.5 0.9	23.75 .33	36.9 0.5
26.2	25.58 -.17	69.3 -0.3	33.86 -.16	15.8 -0.3	48.90-1.06	56.2 +0.4	23.41 -.33	37.3 -0.1
Nov. 5.2	25.42 .15	68.8 0.6	33.70 .15	16.1 0 3	47.85 1.04	56.3 -0.2	23.08 .31	37.2 +0.3
15.2	25.28 .13	68.1 0.8	33.56 .13	16.5 0.4	46.83 1.00	55.8 0.8	22.79 .27	36.6 0.7
25.2	25 16 .10	67.2 1.0	33.45 .10	16.8 0.4	45.86 .92	54.8 1.3	22.53 .23	35.7 1.1
Dec. 5.1	25.08 -.07	66.2 -1.2	33.36 -.07	17.2 -0.4	44.98 -.82	53.2 -1.8	22.33 -.17	34.4 +1.5
15.1	25.03 -.03	64.9 1.3	33.32 -.03	17.6 0.4	44.22 .70	51.1 2.3	22.19 .11	32.8 1.8
25.1	25.02 +.01	63.6 1.4	33.30 +.01	17.9 0.3	43.59 .55	48.6 2.7	22.11 -.04	30.8 2.1
35.1	25.04 +.04	62.1 -1.5	33.33 +.05	18.3 -0.3	43.12 -.38	45.7 -3.1	22.11 +.03	28.6 +2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cygni.		π Capricorni.		ε Delphini.		Groombridge 3241.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 20 17	° ′ +39 52	h m 20 20	° ′ −18 35	h m 20 27	° ′ +10 54	h m 20 30	° ′ +72 7
	s	″	s	″	s	″	s	″
Jan. 0.1	58.94 −.04	57.7 −2.6	33.78 +.03	48.2 0.0	34.30 .00	18.7 −1.5	26.93 −.33	70.5 −2.9
10.0	58.92 +.01	54.9 2.8	33.82 .06	48.1 +0.1	34.32 +.04	17.2 1.6	26.66 .21	67.5 3.1
20.0	58.96 .05	52.1 2.8	33.90 .10	48.0 0.2	34.38 .07	15.6 1.6	26.52 −.08	64.3 3.3
30.0	59.03 .10	49.2 2.8	34.02 .13	47.7 0.3	34.46 .10	14.0 1.5	26.51 +.05	60.9 3.3
Feb. 9.0	59.16 .15	46.5 2.6	34.17 .16	47.4 0.4	34.58 .14	12.6 1.3	26.62 .18	57.6 3.2
18.9	59.33 +.19	44.0 −2.3	34.34 +.19	47.0 +0.5	34.73 +.17	11.4 −1.1	26.87 +.31	54.5 −3.0
28.9	59.54 .23	41.9 2.0	34.55 .22	46.4 0.6	34.92 .19	10.5 0.8	27.24 .43	51.6 2.7
Mar. 10.9	59.78 .26	40.2 1.5	34.78 .24	45.7 0.8	35.12 .22	9.9 0.5	27.73 .53	49.1 2.3
20.9	60.06 .29	38.9 1.0	35.03 .26	44.8 0.9	35.36 .24	9.6 −0.1	28.30 .62	47.1 1.7
30.8	60.37 .32	38.2 −0.4	35.30 .28	43.8 1.0	35.61 .26	9.7 +0.3	28.96 .69	45.6 1.1
Apr. 9.8	60.70 +.34	38.1 +0.2	35.59 +.30	42.7 +1.2	35.88 +.28	10.1 +0.7	29.67 +.73	44.8 −0.5
19.8	61.04 .35	38.6 0.7	35.90 .31	41.6 1.2	36.17 29	11.0 1.0	30.42 .75	44.6 +0.1
29.7	61.39 .35	39.5 1.3	36.21 .31	40.3 1.3	36.46 .30	12.2 1.4	31.17 .75	45.1 0.8
May 9.7	61.74 .34	41.1 1.8	36.52 .31	39.0 1.3	36.76 .30	13.7 1.7	31.92 .73	46.1 1.4
19.7	62.08 .33	43.1 2.2	36.83 .31	37.7 1.3	37.06 .29	15.5 1.9	32.62 .68	47.8 1.9
29.7	62.39 +.30	45.5 +2.6	37.14 +.30	36.5 +1.2	37.34 +.28	17.5 +2.1	33.27 +.62	50.0 +2.4
June 8.6	62.68 .27	48.2 2.8	37.42 .27	35.3 1.1	37.61 .26	19.6 2.2	33.85 .54	52.6 2.8
18.6	62.94 .24	51.2 3.1	37.68 .25	34.3 0.9	37.86 .23	21.9 2.3	34.34 .44	55.6 3.2
28.6	63.16 .19	54.4 3.2	37.91 .21	33.4 0.8	38.07 .20	24.1 2.2	34.72 .33	58.9 3.4
July 8.6	63.33 .14	57.6 3.2	38.11 .17	32.7 0.6	38.25 .16	26.4 2.2	35.00 .21	62.4 3.6
18.5	63.44 +.09	60.9 +3.2	38.26 +.13	32.2 +0.4	38.39 +.12	28.5 +2.1	35.15 +.09	66.0 +3.7
28.5	63.51 +.04	64.1 3.1	38.37 .08	31.9 0.2	38.48 .07	30.5 1.9	35.19 −.03	69.7 3.7
Aug. 7.5	63.52 −.02	67.1 2.9	38.43 +.04	31.7 +0.1	38.53 +.03	32.4 1.7	35.10 .15	73.3 3.6
17.4	63.48 .07	70.0 2.7	38.44 −.01	31.7 −0.1	38.54 −.02	34.0 1.5	34.90 .26	76.8 3.4
27.4	63.39 .11	72.6 2.5	38.41 .06	31.8 0.2	38.50 .06	35.5 1.3	34.58 .37	80.2 3.2
Sept. 6.4	63.25 −.15	74.9 +2.0	38.34 −.10	32.1 −0.3	38.43 −.09	36.6 +1.1	34.16 −.46	83.2 +2.9
16.4	63.07 .19	76.8 1.7	38.22 .13	32.4 0.4	38.32 .13	37.6 0.8	33.65 .55	85.9 2.5
26.3	62.86 .22	78.4 1.3	38.08 .16	32.8 0.4	38.18 .15	38.3 0.6	33.07 .62	88.2 2.1
Oct. 6.3	62.63 .24	79.5 0.9	37.92 .17	33.2 0.4	38.02 .16	38.7 +0.3	32.42 .67	90.1 1.6
16.3	62.39 .25	80.2 +0.5	37.75 .17	33.6 0.4	37.85 .17	38.9 0.0	31.72 .71	91.5 1.1
26.2	62.14 −.25	80.4 0.0	37.58 −.17	34.0 −0.4	37.68 −.17	38.8 −0.2	31.01 −.72	92.4 +0.6
Nov. 5.2	61.90 .23	80.2 −0.5	37.41 .16	34.3 0.3	37.52 .17	38.3 0.5	30.29 .72	92.7 0.0
15.2	61.68 .21	79.4 1.0	37.26 .13	34.6 0.3	37.37 .14	37.8 0.7	29.58 .60	92.4 −0.5
25.2	61.48 .19	78.2 1.4	37.14 .11	34.8 0.2	37.24 .12	37.0 1.0	28.91 .65	91.6 1.1
Dec. 5.1	61.31 −.15	76.6 −1.9	37.05 −.07	35.0 −0.2	37.13 −.09	35.9 −1.2	28.29 −.58	90.2 −1.7
15.1	61.17 .11	74.6 2.2	36.99 .04	35.1 −0.1	37.06 .06	34.6 1.3	27.75 .50	88.2 2.2
25.1	61.08 .06	72.2 2.5	36.97 −.01	35.2 0.0	37.02 −.02	33.2 1.5	27.30 .40	85.8 2.6
35.1	61.03 −.01	69.5 −2.8	36.99 +.04	35.2 0.0	37.02 +.01	31.6 −1.6	26.95 −.30	83.0 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cygni.		μ Aquarii.		ν Cygni.		12 Year Cat. 1879.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$20^{h}\ 37^{m}$	$+44^{\circ}\ 51'$	$20^{h}\ 46^{m}$	$-9^{\circ}\ 25'$	$20^{h}\ 52^{m}$	$+40^{\circ}\ 42'$	$20^{h}\ 52^{m}$	$+80^{\circ}\ 6'$
	s	″	s	″	s	″	s	″
Jan. 0.1	23.76 −.08	46.3 −2.7	17.20 .00	26.7 −0.5	45.87 −.07	61.8 −2.4	47.60 −.78	50.7 −2.5
10.1	23.71 −.03	43.6 2.8	17.22 +.03	27.1 0.4	45.81 −.03	59.3 2.7	46.93 .57	47.9 2.9
20.0	23.71 +.02	40.6 2.9	17.27 .07	27.5 0.3	45.80 +.01	56.6 2.8	46.48 .34	44.9 3.2
30.0	23.76 .07	37.7 2 9	17.35 .10	27.8 0.2	45.83 .06	53.8 2.8	46.26 −.10	41.7 3.3
Feb. 9.0	23.86 .12	34.8 2.8	17.46 .13	28.0 −0.1	45.92 .10	51.0 2.7	46.28 +.14	38.4 3.3
19.0	24 01 +.17	32.1 −2.6	17.61 +.16	28.0 +0.1	46.04 +.15	48.5 −2.4	46.54 +.38	35.1 −3.1
28.9	24.20 .22	29.7 2.2	17.78 .19	27.8 0.3	46.21 .19	46.2 2.1	47.04 .61	32.1 2.9
Mar. 10.9	24.44 .26	27.7 1.8	17.98 .21	27.4 0.5	46.43 .23	44.2 1.7	47.76 .81	29.4 2.5
20.9	24.72 .30	26.2 1.2	18.20 .24	26.2 0.7	46.68 .27	42.8 1.2	48.66 .99	27.1 2.0
30.8	25.04 .33	25.2 0.7	18.45 .26	26.1 0.9	46.97 .30	41.8 0.7	49.72 1.13	25.4 1.5
Apr. 9.8	25.38 +.35	24.8 −0.1	18.72 +.27	25.1 +1.1	47.28 +.33	41.4 −0.2	50.90+1.23	24.2 −0.9
19.8	25.74 .37	25.0 +0.5	19.00 .29	23.9 1.2	47.62 .34	41.5 +0.4	52.16 1.28	23.5 −0.3
29.8	26.11 .37	25.8 1.1	19.30 .30	22.5 1.4	47.97 .36	42.2 1.0	53.45 1.29	23.6 +0.3
May 9.7	26.48 .37	27.1 1.6	19.60 .30	21.0 1.5	48.33 .36	43.4 1.5	54.74 1.27	24.3 1.0
19.7	26.85 .36	29.0 2.1	19.90 .30	19.5 1.6	48.68 .35	45.2 1.9	55.97 1.20	25.5 1.5
29.7	27.20 +.33	31.3 +2.5	20.20 +.29	17.9 +1.6	49.03 +.33	47.3 +2.4	57.12+1.10	27.3 +2.1
June 8.6	27.52 .31	33.9 2.8	20.49 .28	16.3 1.6	49.35 .31	49.9 2.7	58.16 .96	29.6 2.5
18.6	27.81 .27	36.9 3.1	20.76 .26	14.8 1.5	49.64 .27	52.7 3.0	59.04 .80	32.3 2.9
28.6	28.05 .21	40.1 3.3	21.00 .22	13.4 1.3	49.89 .23	55.8 3.2	59.75 .62	35.4 3.2
July 8.6	28.25 .17	43.4 3.4	21.20 .19	12.1 1.2	50.10 .19	59.0 3.3	60.28 .42	38.7 3.4
18.5	28.39 +.12	46.8 +3.4	21.37 +.15	11.0 +1.0	50.26 +.14	62.3 +3.3	60.60 +.22	42.2 +3.6
28.5	28.48 +.06	50.2 3.3	21.50 .10	10.0 0.8	50.37 .08	65.5 3.2	60.71 +.01	45.8 3.7
Aug. 7.5	28.51 .00	53.4 3.2	21.58 .06	9.3 0.6	50.43 +.03	68.7 3.1	60.62 −.20	49.5 3.7
17.5	28.48 −.06	56.5 3.0	21.61 +.01	8.7 0.5	50.43 −.02	71 7 2.9	60.32 .40	53.1 3.6
27.4	28.40 .11	59.4 2.7	21.60 −.03	8.3 0.3	50.38 .08	74.6 2.7	59.82 .59	56.6 3.4
Sept. 6.4	28.26 −.15	62.0 +2.4	21.55 −.07	8.1 +0.1	50.28 −.12	77.1 +2.4	59.14 −.77	59.8 +3.1
16.4	28.09 .20	64.2 2.1	21.46 .10	8.1 0.0	50.13 .16	79.4 2.1	58.30 .92	62.9 2.9
26.3	27.88 .23	66.1 1.7	21.34 .13	8.2 −0.1	49.95 .20	81.2 1.7	57.30 1.06	65.5 2.5
Oct. 6.3	27.64 .25	67.6 1.2	21.20 .15	8.4 0.2	49.75 .22	82.7 1.3	56.18 1.17	67.8 2.0
16.3	27.38 .26	68.6 0.8	21.04 .16	8.7 0.3	49.52 .23	83.8 0.8	54.97 1.25	69.6 1.6
26.3	27.11 −.27	69.1 +0.3	20.88 −.16	9.0 −0.4	49.28 −.24	84.4 +0.4	53.68−1.31	71.0 +1.1
Nov. 5.2	26.85 .26	69.1 −0.2	20.72 .15	9.4 0.4	49.04 .23	84.5 −0.1	52.36 1.33	71.7 +0.5
15.2	26.59 .24	68.6 0.7	20.58 .14	9.9 0.5	48.82 .22	84.1 0.6	51.04 1.31	72.0 −0.1
25.2	26.36 .22	67.6 1.2	20.45 .11	10.4 0.5	48.60 .20	83.3 1.1	49.75 1.26	71.6 0.7
Dec. 5.2	26.15 −.19	66.1 −1.7	20.35 −.09	10.9 −0.5	48.41 −.18	82.0 −1.5	48.53−1.17	70.6 −1.2
15.1	25.98 .15	64.2 2.1	20.28 .06	11.4 0.5	48.25 .14	80.2 1.9	47.42 1.05	69.1 1.8
25.1	25.85 .11	61.9 2.5	20.24 −.03	11.9 0.5	48.13 .10	78.1 2.3	46.45 .89	67.0 2.3
35.1	25.77 −.06	59.3 −2.7	20.23 .00	12.4 −0.5	48.04 −.07	75.7 −2.7	45.65 −.70	64.5 −2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61^1 Cygni.		ζ Cygni.		α Cephei.		1 Pegasi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	21h 1m	+38° 10′	21h 7m	+29° 44′	21h 15m	+62° 5′	21h 16m	+19° 17′
	s	″	s	″	s	″	s	″
Jan. 0.1	36.02 −.07	24.7 −2.3	54.56 −.06	48.8 −2.1	44.37 −.24	27.5 −2.4	37.63 −.05	71.4 −1.7
10.1	35.97 −.03	22.4 2.4	54.52 −.02	46.6 2.2	44.16 .17	24.8 2.8	37.60 −.02	69.6 1.8
20.0	35.96 +.01	19.9 2.5	54.51 +.01	44.3 2.3	44.02 .10	21.9 3.1	37.60 +.02	67.8 1.8
30.0	36.00 .06	17.3 2.6	54.54 .05	42.0 2.3	43.96 −.02	18.8 3.2	37.63 .05	66.0 1.8
Feb. 9.0	36.08 .10	14.8 2.5	54.61 .09	39.7 2.2	43.99 + 06	15.6 3.2	37.70 .08	64.2 1.7
19.0	36.21 +.15	12.4 −2.3	54.72 +.13	37.6 −2.0	44.09 +.14	12.4 −3.1	37.80 +.12	62.6 −1.5
28.9	36.38 .19	10.2 2.0	54.87 .16	35.7 1.7	44.28 .22	9.5 2.8	37.93 .15	61.2 1.2
Mar. 10.9	36.59 .23	8.4 1.6	55.05 .20	34.1 1.4	44.54 .30	6.8 2.5	38.10 .18	60.2 0.9
20.9	36.83 .26	7.1 1.1	55.27 .23	33.[illegible] 0.9	44.87 .37	4.6 2.0	38.30 .21	59.4 0.5
30.9	37.12 .30	6.2 0.6	55.52 .26	32.3 −0.5	45.27 .43	2.8 1.5	38.53 .24	59.1 −0.1
Apr. 9.8	37.43 +.32	5.9 −0.1	55.79 +.29	32.1 0.0	45.72 +.47	1.7 −0.9	38.79 +.27	59.2 +0.3
19.8	37.76 .34	6.1 +0.5	56.09 .31	32.4 +0.5	46.21 .51	1.1 −0.3	39.06 .29	59.7 0.7
29.8	38.12 .35	6.8 1.0	56.41 .32	33.1 1.0	46.73 .53	1.2 +0.4	39.36 .30	60.7 1.1
May 9.7	38.47 .36	8.1 1.5	56.73 .33	34.4 1.5	47.26 .53	1.8 1.0	39.67 .31	62.0 1.5
19.7	38.83 .35	9.9 2.0	57.06 .32	36.1 1.9	47.78 .52	3.1 1.6	39.98 .31	63.7 1.8
29.7	39.18 +.33	12.1 +2.4	57.38 +.31	38.2 +2.2	48.29 +.49	4.9 +2.1	40.29 +.30	65.7 +2.1
June 8.7	39.51 .32	14.7 2.7	57.68 .30	40.5 2.5	48.76 .45	7.2 2.5	40.58 .29	67.9 2.3
18.6	39.81 .29	17.5 3.0	57.97 .27	43.2 2.7	49.19 .40	10.0 2.9	40.86 .27	70.3 2.5
28.6	40.08 .25	20.6 3.2	58.22 .23	46.0 2.9	49.56 .34	13.0 3.2	41.12 .24	72.9 2.6
July 8.6	40.30 .20	23.8 3.3	58.44 .20	48.9 2.9	49.87 .27	16.4 3.5	41.33 .20	75.5 2.6
18.6	40.48 +.16	27.1 +3.3	58.61 +.15	51.8 +2 9	50.10 +.19	19.9 +3.6	41.52 +.16	78.0 +2.5
28.5	40.61 .10	30.4 3.2	58.74 .10	54.7 2.9	50.26 .11	23.6 3.7	41.66 .12	80.5 2.4
Aug. 7.5	40.69 +.05	33.6 3.1	58.82 .06	57.5 2.7	50.34 +.03	27.2 3.7	41.75 .07	82.9 2 3
17.5	40.72 .00	36.6 3.0	58.85 +.01	60.2 2.6	50.33 −.05	30.8 3.6	41.80 +.03	85.1 2.1
27.4	40.69 −.05	39.5 2.7	58.84 −.04	62.6 2.3	50.24 .12	34.3 3.4	41.81 −.02	87.1 1.9
Sept. 6.4	40.62 −.09	42.1 +2.4	58.78 −.08	64.8 +2.0	50.08 −.20	37.6 +3.1	41.77 −.06	88.8 +1.6
16.4	40.50 .13	44.4 2.1	58.68 .12	66.7 1.7	49.85 .26	40.6 2.8	41.69 .09	90.3 1.3
26.4	40.35 .17	46.3 1.8	58.54 .15	68.3 1.4	49.56 .31	43.2 2.5	41.58 .12	91.5 1.1
Oct. 6.3	40.17 .19	47.9 1.4	58.38 .17	69.6 1.1	49.22 .36	45.5 2.1	41.44 .15	92.4 0.8
16.3	39.97 .21	49.1 0.9	58.20 .19	70.5 0.7	48.84 .39	47.3 1.6	41.29 .16	93.0 0.4
26.3	39.76 −.21	49.8 +0.5	58.01 −.19	70.9 +0.3	48.44 −.42	48.7 +1.0	41.12 −.17	93.3 +0.1
Nov. 5.3	39.54 .21	50.0 0.0	57.82 .19	71.0 −0.1	48.02 .42	49.4 +0.5	40.96 .17	93.2 −0.2
15.2	39.33 .20	49.8 −0.4	57.63 .18	70.7 0.5	47.60 .42	49.7 −0.1	40.80 .16	92.9 0.5
25.2	39.14 .18	49.2 0.9	57.46 .16	70.0 0.9	47.18 .40	49.3 0.6	40.64 .14	92.2 0.8
Dec. 5.2	38.97 −.16	48.0 −1.3	57.30 −.14	68.8 −1.3	46.80 −.37	48.4 −1.2	40.51 −.12	91.2 −1.1
15.1	38.82 .13	46.5 1.7	57.18 .12	67.4 1.6	46.44 .33	47.0 1.7	40.40 .10	90.0 1.4
25.1	38.71 .09	44.6 2.1	57.07 .08	65.6 1.9	46.14 .28	45.0 2.2	40.32 .07	88.5 1.6
35.1	38.64 −.05	42.4 −2.5	57.01 −.04	63.5 −2.2	45.89 −.22	42.5 −2.6	40.26 −.04	86.8 −1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aquarii.		β Cephei.		ξ Aquarii.		ε Pegasi.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	21h 25m	−6° 4′	21h 27m	+70° 2′	21h 31m	−8° 22′	21h 38m	+9° 20′
	s	″	s	″	s	″	s	″
Jan. 0.1	20.80 −.03	77.9 −0.6	5.84 −.40	54.1 −2.3	28.23 −.04	53.6 −0.4	23.49 −.05	13.1 −1.2
10.1	20.79 .00	78.4 0.5	5.49 .30	51.6 2.7	28.20 −.01	54.0 0.4	23.45 −.02	11.8 1.3
20.1	20.80 +.02	79.0 0.5	5.24 .20	48.7 3.0	28.21 +.02	54.4 0.3	23.44 .00	10.5 1.3
30.0	20.84 .06	79.4 0.3	5.08 −.09	45.6 3.2	28.25 .05	54.7 0.2	23.46 +.03	9.3 1.2
Feb. 9.0	20.91 .09	79.7 −0.2	5.05 +.02	42.4 3.2	28.31 .08	54.8 −0.1	23.51 .07	8.1 1.1
19.0	21.01 +.12	79.8 0.0	5.13 +.14	39.1 −3.2	28.41 +.11	54.8 +0.1	23.59 +.10	7.0 −0.9
28.9	21.14 .15	79.7 +0.2	5.32 .25	36.0 3.0	28 54 .14	54.6 0.3	23.70 .13	6.2 0.7
Mar. 10.9	21.30 .18	79.4 0.4	5.63 .36	33.2 2.7	28.69 .17	54.2 0.5	23.85 .16	5.6 0.4
20.9	21.50 .20	78.9 0.6	6.04 .46	30.7 2.2	28.88 .20	53.5 0.8	24.03 .19	5.4 −0.1
30.9	21.71 .23	78.2 1.0	6.55 .54	28.7 1.7	29.09 .23	52.7 1.0	24.24 .22	5.4 +0.2
Apr. 9.8	21.96 +.25	77.2 +1.1	7.12 +.61	27.3 - 1.2	29.34 +.25	51.6 +1.2	24.47 +.25	5.8 +0.6
19.8	22.22 .28	76.0 1.3	7.76 .66	26.4 −0.6	29.60 .27	50.3 1.4	24.73 .27	6.6 0.9
29.8	22.51 .29	74 6 1.5	8.44 .69	26 1 +0.1	29.88 .29	48 8 1.5	25.01 .29	7.7 1.3
May 9.8	22.81 .30	73.0 1.6	9.13 .69	26.5 0.7	30.18 .30	47.2 1.7	25.31 .30	9.1 1.5
19.7	23.11 .30	71.3 1.7	9.82 .68	27.5 1.3	30.49 .31	45.5 1.7	25.61 .30	10.8 1.8
29.7	23.41 +.30	69.5 +1.8	10.49 +.65	29.1 +1.8	30.80 +.31	43.8 +1.8	25.92 +.30	12.7 +2.0
June 8.7	23.71 .29	67.8 1.8	11.12 .60	31.2 2.3	31.10 .30	42.0 1.7	26.21 .29	14.7 2.1
18.6	24.00 .27	66.0 1.7	11.68 .53	33.7 2.7	31.39 .28	40.3 1.7	26.50 .28	16.9 2.2
28.6	24.26 .25	64.3 1.6	12.18 .45	36.7 3.1	31.65 .25	38.7 1.6	26.76 .25	19.1 2.2
July 8.6	24.49 .22	62.8 1.5	12.58 .36	39.9 3.4	31.89 .21	37.2 1.4	27.00 .22	21.4 2.2
18.6	24.69 +.18	61.4 +1.3	12.89 +.26	43.4 +3.6	32.10 +.19	35.9 +1.2	27.20 +.18	23.5 +2.1
28.5	24.85 .14	60.1 1.1	13.10 .15	47.1 3.7	32.26 .14	34.8 1.0	27.36 .14	25.6 2.0
Aug. 7.5	24.96 .09	59.1 0.9	13.20 +.04	50.8 3.7	32.38 .10	33.9 0.8	27.48 .10	27.4 1.8
17.5	25.03 +.05	58.3 0.7	13.19 −.06	54.5 3.7	32.46 .05	33.2 0.6	27.56 .05	29.2 1.6
27.5	25.06 .00	57.7 0.5	13.08 .16	58.1 3.6	32.49 +.01	32.7 0.4	27.59 +.01	30.7 1.4
Sept. 6.4	25.04 −.04	57.3 +0.3	12.87 −.26	61.6 +3.3	32.48 −.03	32.4 +0.2	27.58 −.03	32.0 +1.2
16.4	24.98 .07	57.1 +0.1	12.56 .35	64.8 3.1	32.43 .07	32.4 0.0	27.53 .07	33.0 0.9
26.4	24.89 .10	57.0 0.0	12.17 .43	67.7 2.8	32.35 .10	32.4 −0.2	27.45 .10	33.8 0.7
Oct. 6.3	24.78 .13	57.1 −0.2	11.71 .49	70.2 2.3	32.23 .12	32.6 0.3	27.34 .12	34.4 0.4
16.3	24.64 .14	57.4 0.3	11.19 .54	72.4 1.9	32.10 .14	33.0 0.4	27.21 .14	34.7 +0.2
26.3	24.49 −.15	57.8 −0.4	10.63 −.58	74.0 +1.4	31.95 −.15	33.4 −0.5	27.06 −.15	34.8 0.0
Nov. 5.3	24.34 .15	58.2 0.5	10.03 .60	75.1 0.8	31 80 .15	33.9 0.5	26.92 .15	34.6 −0.3
15.2	24.20 .14	58.7 0.5	9.43 .60	75.6 +0.2	31.66 .14	34.4 0.5	26.77 .14	34.2 0.5
25.2	24.06 .12	59.3 0.6	8 83 .59	75.6 −0.3	31.53 .12	35 0 0.6	26.63 .13	33.6 0.7
Dec. 5.2	23.95 −.10	59.9 −0.6	8.25 −.56	74.9 −0.9	31.41 −.11	35.6 −0.6	26.50 −.12	32.8 −0.9
15.2	23.86 .08	60.5 0.6	7.72 .51	73 7 1.5	31.31 .08	36.1 0.6	26.40 .10	31.8 1.0
25.1	23.79 .05	61.1 0.6	7.24 .44	71.9 2.0	31.24 .06	36.7 0.5	26.32 .07	30.7 1.2
35.1	23.75 −.03	61.8 −0.6	6.83 −.37	69.7 −2.5	31.20 −.03	37.2 −0.5	26.26 −.04	29.5 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	11 Cephei.		μ Capricorni.		79 Draconis.		α Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 21 40	° ′ +70 45	h m 21 46	° ′ −14 5	h m 21 51	° ′ +73 8	h m 21 59	° ′ −0 53
	s	″	s	″	s	″	s	″
Jan. 0.1	9.44 −.43	86.7 −2.2	51.78 −.06	81.1 −0.2	21.66 −.53	60.8 −2.0	43.53 −.06	27.3 −0.8
10.1	9.05 .35	84.3 2.6	51.75 −.02	81.2 −0.1	21.18 .44	58.6 2.5	43.48 .03	28.1 0.8
20.1	8.75 .25	81.6 2.9	51.74 +.01	81.3 0.0	20.80 .32	55.9 2.8	43.46 −.01	28.8 0.7
30.0	8.56 .13	78.5 3.1	51.76 .04	81.2 +0.2	20.53 .20	53.0 3.1	43.47 +.02	29.5 0.6
Feb. 9.0	8.48 −.02	75.3 3.2	51.82 .07	81.0 0.3	20.40 −.07	49.8 3.2	43.50 .05	30.0 0.5
19.0	8.53 +.10	72.1 −3.2	51.90 +.10	80.6 +0.5	20.40 +.07	46.5 −3.2	43.57 +.08	30.4 −0.3
Mar. 1.0	8.70 .22	68.9 3.0	52.01 .13	80.0 0.7	20.54 .21	43.4 3.1	43.66 .11	30.6 −0.1
10.9	8.98 .34	66.0 2.7	52.16 .16	79.2 0.9	20.82 .35	40.4 2.8	43.79 .14	30.6 +0.1
20.9	9.37 .45	63.5 2.3	52.34 .19	78.2 1.1	21.23 .47	37.7 2.5	43.95 .18	30.4 0.4
30.9	9.87 .55	61.3 1.9	52.54 .22	77.1 1 2	21.76 .58	35.4 2.0	44.14 .21	29.8 0.7
Apr. 9.9	10.44 +.62	59.7 −1.3	52.78 +.25	75.7 +1.4	22.38 +.67	33.7 −1.5	44.36 +.23	29.0 +1.0
19.8	11.09 .67	58.7 0.7	53.04 .27	74.2 1.6	23.09 .74	32.4 0.9	44 60 .26	27.9 1.2
29.8	11.78 .71	58.3 −0.1	53.32 .29	72.6 1.7	23.86 .78	31.8 −0.3	44.87 .28	26.6 1.5
May 9.8	12.49 .72	58.5 +0.5	53.62 .30	70.9 1.7	24.65 .81	31.8 +0.3	45.16 .30	25.0 1.6
19.7	13.21 .71	59.3 1.1	53.93 .31	69.2 1.7	25.46 .80	32.5 0.9	45.46 .30	23.3 1.8
29.7	13.91 +.69	60.7 +1.7	54.24 +.31	67.4 +1.7	26.26 +.78	33 7 +1.5	45.77 +.31	21.4 +1.9
June 8.7	14.58 .64	62.6 2.2	54.56 .31	65.7 1.6	27.01 .73	35.5 2.0	46.07 .30	19.5 1.9
18.7	15.19 .57	65.1 2.6	54.86 .28	64.1 1.5	27.71 66	37.7 2.5	46.36 .29	17.5 1.9
28.6	15.72 .50	67.9 3.0	55.14 .27	62.7 1.4	28.33 58	40.4 2.9	46.64 .27	15.6 1 9
July 8.6	16.17 .40	71.1 3.3	55.39 .24	61.4 1.3	28.86 .48	43.5 3.2	46.90 .24	13.7 1.8
18.6	16.53 +.30	74.5 +3.5	55.62 +.20	60.3 +1.0	29.28 +.37	46.8 +3.5	47.12 +.21	12.0 +1.6
28.6	16.78 .20	78.1 3.7	55.80 .16	59.5 0.7	29.59 .25	50.4 3.6	47.30 .16	10.4 1.5
Aug. 7.5	16.92 +.09	81.8 3.7	55.94 .12	58.9 0.5	29.78 .13	54.1 3.7	47.44 .12	9.1 1.3
17.5	16 95 −.02	85.6 3.7	56.03 .07	58.5 0.3	29.84 +.01	57.8 3.8	47.54 .08	7.9 1.1
27.5	16.88 .13	89 2 3.6	56.08 +.03	58.3 +0.1	29.78 −.12	61.6 3.7	47.60 +.04	6.9 0.8
Sept. 6.4	16.69 −.23	92.8 +3.4	56.09 −.02	58.4 −0.1	29.61 −.23	65.2 +3.5	47.62 −.01	6.2 +0.6
16.4	16.42 .33	96.1 3.2	56.05 .06	58.6 0.3	29.32 .34	68.6 3.3	47.59 .04	5.7 0.4
26.4	16.05 .41	99.1 2.9	55.98 .09	59.0 0.4	28.93 .43	71.8 3.0	47.53 .07	5.4 +0.2
Oct. 6.4	15.60 .48	101.8 2.5	55.87 .12	59.4 0.5	28.45 .52	74.6 2.7	47.44 .10	5.3 0.0
16.3	15.09 .54	104.1 2.1	55.75 .13	60.0 0.6	27.89 .60	77.1 2.2	47.33 .12	5.4 −0.1
26.3	14.52 −.58	106.0 +1.6	55.60 −.15	60.6 −0.6	27.26 −.65	79.1 +1.8	47.20 −.13	5.6 −0.3
Nov. 5.3	13.92 .61	107.2 1.0	55.46 .15	61.2 0.6	26.59 .69	80.6 1.2	47.06 .14	5.9 0.4
15.3	13.31 .62	108.0 +0.4	55.31 .14	61.8 0.6	25.89 .71	81.6 0.7	46.92 .14	6.4 0.5
25.2	12.69 .61	108.2 −0.1	55.17 .13	62.4 0.5	25.18 .71	81.9 +0.1	46.79 .13	7.0 0.6
Dec. 5.2	12.08 −.59	107.7 −0.7	55.05 −.11	62.9 −0.5	24.48 −.69	81.7 −0.5	46.67 −.12	7.7 −0.7
15.2	11.52 .54	106.7 1.3	54.94 .09	63.3 0.4	23.81 .65	80.8 1.1	46.56 .10	8.4 0.8
25.1	11.00 .48	105.1 1.9	54.86 .07	63.7 0.3	23.20 .58	79.4 1.7	46.47 .08	9.2 0.8
35.1	10.56 −.41	102.9 −2.5	54.81 −.05	64.0 −0.2	22.65 −.48	77.4 −2.2	46.40 −.05	10.0 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Gruis.		θ Aquarii.		π Aquarii.		η Aquarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$22^{h}\ 0^{m}$	$-47^{\circ}\ 31'$	$22^{h}\ 10^{m}$	$-8^{\circ}\ 21'$	$22^{h}\ 19^{m}$	$+0^{\circ}\ 46'$	$22^{h}\ 29^{m}$	$-0^{\circ}\ 43'$
	s	″	s	″	s	″	s	″
Jan. 0.1	47.15 −.12	58.6 +1.4	36.58 −.07	69.4 −0.5	15.30 −.07	51.0 −0.8	17.85 −.08	25.2 −0.7
10.1	47.06 .08	57.1 1.6	36.53 .04	69.9 0.4	15.24 .05	50.2 0.8	17.78 .06	25.9 0.7
20.1	47.00 −.03	55.3 1.9	36.50 −.01	70.2 0.3	15.20 −.03	49.4 0.8	17.74 .03	26 6 0.7
30.1	47.00 +.01	53.4 2.1	36.50 +.01	70.5 −0.2	15.19 .00	48.7 0.7	17.72 −.01	27.2 0.6
Feb. 9.0	47.03 .06	51.1 2.3	36.52 .04	70.5 0.0	15.20 +.03	48.1 0.6	17.72 +.02	27.8 0.5
19.0	47.12 +.10	48.7 +2.5	36.58 +.07	70.5 +0.2	15.25 +.06	47.6 −0.4	17.76 +.05	28.1 −0.3
Mar. 1.0	47.24 .15	46.2 2.6	36.66 .10	70.2 0 4	15.32 .09	47.4 −0.2	17.82 .08	28.3 −0.1
11.0	47.41 .19	43.6 2.6	36.78 .13	69.7 0.6	15.43 .12	47.3 +0.1	17.92 .11	28.3 +0.2
20.9	47.63 .24	41.1 2.6	36.93 .17	69.0 0.8	15.57 .16	47.5 0.3	18.05 .15	28.0 0.4
30.9	47.89 .28	38.5 2.6	37.12 .20	68.1 1.1	15.74 .19	47.9 0.6	18.22 .18	27.4 0.7
Apr. 9.9	48.19 +.32	36.0 +2.5	37.33 +.23	66.9 +1.3	15.94 +.22	48.7 +0.9	18.41 +.21	26.6 +1.0
19.9	48.52 .35	33.6 2.3	37.57 .25	65.6 1.5	16.18 .25	49.7 1.1	18.64 .24	25.6 1.2
29.8	48.89 .38	31.4 2.1	37.84 .28	64.0 1.6	16.44 .27	51.0 1.4	18.89 .27	24.2 1.4
May 9.8	49.28 .40	29.4 1.8	38.12 .30	62.3 1.8	16.72 .29	52.5 1.6	19.17 .29	22.7 1.7
19.8	49.69 .41	27.7 1.6	38.42 .31	60.5 1.8	17.02 .30	54.2 1.8	19.47 .30	20.9 1.8
29.7	50.10 +.42	26.3 +1.2	38.74 +.31	58.7 +1.9	17.32 +.31	56.1 +1.9	19.77 +.31	19.0 +1.9
June 8.7	50.52 .41	25.3 0.8	39.04 .31	56.8 1.8	17.63 .30	58.1 2.0	20.08 .31	17.1 2.0
18.7	50.92 .39	24.6 0.5	39.35 .30	55.0 1.8	17.93 .29	60.1 2.0	20.38 .30	15.1 2.0
28.7	51.30 .37	24.4 +0.1	39.63 .28	53.3 1.7	18.22 .27	62.1 2.0	20.67 .28	13.1 2.0
July 8.6	51.66 .33	24.5 −0.3	39.90 .25	51.7 1.6	18.48 .25	64.0 1.9	20.94 .26	11.2 1.8
18.6	51.96 +.28	25.0 −0.7	40.13 +.22	50.2 +1.3	18.72 +.22	65.9 +1.7	21.18 +.22	9.4 +1.7
28.6	52.22 .23	25.8 1.0	40.33 .18	49.0 1.1	18.91 .18	67.6 1.6	21.39 .19	7.8 1.5
Aug. 7.5	52.42 .17	27.0 1.3	40.49 .14	48.0 0.9	19.07 .14	69.0 1.4	21.56 .15	6.4 1 3
17.5	52.56 .11	28.5 1.6	40.60 .09	47.3 0.6	19.19 .10	70.3 1.2	21.69 .11	5.2 1.1
27.5	52.64 +.04	30.2 1.8	40.67 .05	46.8 0.4	19.27 .05	71.4 0.9	21.78 .06	4.2 0.9
Sept. 6.5	52.65 −.02	32.0 −1.9	40.70 +.01	46.5 +0.2	19.30 +.01	72.2 +0.7	21.82 +.02	3.4 +0.7
16.4	52.60 .08	34.0 1.9	40.68 −.03	46.4 0.0	19.29 −.03	72.9 0.5	21.82 −.02	2.9 0.4
26.4	52.49 .13	35.9 1.9	40.63 .07	46.5 −0.2	19.25 .06	73.3 0.3	21.79 .05	2.6 +0.2
Oct. 6.4	52.34 .17	37.7 1.7	40.55 .10	46.7 0.3	19.17 .09	73.4 +0.1	21.72 .08	2.5 0.0
16.4	52.14 .21	39.3 1.5	40.44 .12	47.1 0.4	19.07 .11	73.5 −0.1	21.63 .10	2.5 −0.2
26.3	51.92 −.23	40.7 −1.3	40.32 −.13	47.6 −0.5	18.96 −.12	73.3 −0.2	21.52 −.12	2.8 −0.4
Nov. 5.3	51.68 .24	41.8 0.9	40.18 .14	48.2 0.6	18.83 .13	73.0 0.4	21.40 .13	3.1 0.4
15.3	51.44 .24	42.6 0.6	40.04 .14	48.8 0.6	18.70 .13	72.5 0.5	21.27 .13	3.6 0.6
25.2	51.21 .23	42.9 −0.2	39.91 .13	49.4 0.6	18.56 .13	71.9 0.6	21.14 .13	4.2 0.6
Dec. 5.2	50.99 −.21	42.9 +0.2	39.78 −.12	50.0 −0.6	18.44 −.12	71.3 −0.7	21.01 −.12	4.9 −0.7
15.2	50.80 .18	42.4 0.6	39.67 .10	50.6 0.6	18 33 .10	70.5 0.8	20.90 .11	5.6 0.8
25.2	50.64 .14	41.6 1.0	39.58 .08	51.2 0.5	18.23 .09	69.7 0.8	20.80 .09	6.3 0.8
35.1	50.51 −.10	40.4 +1.4	39.51 −.05	51.7 −0.5	18.15 −.07	68.9 −0.8	20.72 −.07	7.1 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei (B.)		ζ Pegasi.		ι Cephei.		λ Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 30	° ′ +75 36	h m 22 35	° ′ +10 12	h m 22 45	° ′ +65 34	h m 22 46	° ′ −8 11
	s	″	s	″	s	″	s	″
Jan. 0.2	10.33 −.70	90.2 −1.4	34.97 −.09	65.9 −1.1	28.54 −.40	70.9 −1.4	27.86 −.09	82.2 −0.5
10.1	9.67 .62	88.4 2.0	34.89 .07	64.8 1.1	28.17 .35	69.2 1.9	27.78 .07	82.6 0.4
20.1	9.10 .51	86.1 2.5	34.83 .04	63.6 1.2	27 86 .29	67.1 2.4	27.72 .05	83.0 0.3
30.1	8.66 .38	83.5 2.8	34.80 −.02	62.4 1.1	27.60 .22	64.5 2.7	27.69 −.02	83.2 −0.1
Feb. 9.1	8.35 .23	80.5 3.1	34.80 +.01	61.3 1.0	27.42 .12	61.6 3.0	27.68 .00	83.3 0.0
19.0	8.20 −.07	77.3 −3.2	34.82 +.04	60.4 −0.9	27.33 −.05	58.6 −3.1	27.70 +.03	83.2 +0.2
Mar. 1.0	8.21 +.09	74.1 3.2	34 88 .07	59.5 0.7	27.33 +.05	55.6 3.0	27.75 .06	82.9 0.4
11.0	8.38 .26	71.0 3.0	34.96 .11	58.9 0.5	27.42 .14	52.6 2.9	27.83 .10	82.4 0.6
20.9	8.72 .42	68.1 2.8	35.09 .14	58.5 −0.2	27.61 .24	49.7 2.7	27.95 .13	81.6 0.9
30.9	9.21 .57	65.5 2.4	35.25 .18	58.5 +0.1	27.89 .33	47.2 2.3	28.10 .17	80.6 1.1
Apr. 9.9	9.83 +.68	63.3 −2.0	35.44 +.21	58.8 +0.4	28.26 +.41	45.2 −1.8	28.28 +.20	79.4 +1.3
19.9	10.57 .79	61.6 1.4	35.67 .24	59.4 0.8	28.71 .48	43.5 1.3	28.49 .23	78.0 1.5
29.8	11.39 .86	60.4 0.8	35.92 .27	60.3 1.0	29.22 .53	42.5 0.8	28.74 .26	76.4 1.7
May 9.8	12.28 .91	59.9 −0.2	36.20 .29	61.6 1.4	29.77 57	42.0 −0.2	29.01 .28	74.7 1.8
19.8	13.22 .94	60.0 +0.4	36.50 .30	63.1 1.7	30.36 .60	42.0 +0.4	29.30 .30	72.8 1.9
29.8	14.15 +.93	60.6 +1.0	36.81 +.31	64.9 +1.9	30.96 +.60	42.8 +1.0	29.61 +.31	70 9 +1.9
June 8.7	15.07 .90	61.9 1.5	37.12 .31	66.9 2.1	31.56 .59	44.0 1.5	29.92 .31	68.9 1.9
18.7	15.94 .84	63.6 2.0	37.43 .30	69.0 2.2	32.14 .56	45.8 2.0	30.23 .31	67.0 1.9
28.7	16.75 .76	65.9 2.5	37.72 .28	71.2 2.2	32.69 .52	48.0 2.5	30.53 .29	65.2 1.8
July 8.6	17.46 .67	68.6 2.9	37.99 .26	73.4 2.2	33.18 .47	50.7 2.9	30.81 .27	63.5 1.6
18.6	18.07 +.55	71.7 +3.2	38.24 +.23	75.6 +2.2	33.62 +.40	53.7 +3.2	31.06 +.24	62.0 +1.4
28.6	18.56 .43	75.0 3.5	38.45 .18	77.7 2.0	33.98 .33	57.0 3.4	31.29 .21	60.6 1.2
Aug. 7.6	18.92 .30	78.6 3.6	38.62 .15	79.7 1.9	34.27 .25	60.5 3.6	31.48 .17	59.6 1.0
17.5	19.15 .16	82.3 3.7	38.75 .11	81.5 1.7	34.48 .16	64.1 3.7	31.62 .12	58.8 0.7
27.5	19.24 +.02	86.1 3.8	38.84 .07	83.2 1.5	34.60 +.08	67.8 3.7	31.73 .08	58.2 0.4
Sept. 6.5	19.19 −.11	89.8 +3.7	38.89 +.03	84.6 +1.3	34.63 −.01	71.4 +3.6	31.79 +.04	57.6 +0.2
16.5	19.01 .25	93.5 3.6	38.89 − 01	85.8 1.1	34.58 .09	75.0 3.5	31.81 .00	57.8 0.0
26.4	18.70 .37	96.9 3.4	38.86 .05	86.7 0.8	34.46 .16	78.3 3.3	31.79 −.04	57.8 −0.2
Oct. 6.4	18.27 .48	100.2 3.1	38.80 .08	87.4 0.6	34.26 .23	81.5 3.0	31.74 .07	58.1 0.4
16.4	17.74 .58	103.1 2.7	38.72 .10	87.8 0.4	34.00 .29	84.2 2.6	31.66 .09	58.6 0.5
26.3	17.11 −.67	105.6 +2.3	38.60 −.12	88.1 +0.1	33.67 −.35	86.7 +2.2	31.56 −.11	59.1 −0.6
Nov. 5.3	16.41 .74	107.7 1.8	38.48 .13	88.1 −0.1	33.30 .39	88.6 1.7	31.44 .12	59.8 0.7
15.3	15.64 .79	109.2 1.3	38.35 .13	87.9 0.3	32.90 .42	90.1 1.2	31.31 .13	60.4 0.7
25.3	14.84 .81	110.2 0 7	38.22 .13	87.4 0.5	32.47 .44	91.0 0.7	31.18 .13	61.1 0.7
Dec. 5.2	14.03 −.81	110.5 +0.1	38.09 −.12	86.8 −0.7	32.03 −.44	91.4 +0.1	31.06 −.12	61.8 −0.7
15.2	13.22 .80	110.3 −0.6	37.97 .11	86.0 0.9	31.59 .44	91.2 −0.6	30.94 .11	62.5 0.6
25.2	12.44 .76	109.4 1.2	37.86 .10	85.1 1.0	31.16 .42	90.3 1.1	30.83 .10	63.1 0.6
35.2	11.72 −.67	108.0 −1.8	37.77 −.09	84.0 −1.2	30.76 −.40	88.9 −1.6	30.74 −.09	63.6 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Piscis Australis. (*Fomalhaut.*)		α Pegasi. (*Markab.*)		*o* Cephei.		θ Piscium.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 22 51	° ′ −30 14	h m 22 58	° ′ +14 34	h m 23 13	° ′ +67 27	h m 23 21	° ′ +5 43
	s	″	s	″	s	″	s	″
Jan. 0.2	7.91 −.11	53.2 +0.3	53.48 −.10	24.7 −1.1	47.28 −.45	82.2 −1.0	59.54 −.10	58.7 −0.8
10.2	7.81 .09	52.8 0.5	53.38 .09	23.6 1.2	46.85 .41	80.8 1.5	59.44 .09	57.8 0.9
20.1	7.74 .06	52.1 0.8	53.31 .07	22.3 1.3	46.46 .36	79.0 2.1	59.36 .08	57.0 0.9
30.1	7.68 −.04	51.2 1.1	53.25 .04	21.0 1.3	46.13 .30	76.7 2.5	59.29 .06	56.1 0.8
Feb. 9.1	7.67 .00	50.0 1.3	53.22 −.02	19.8 1.2	45.87 .21	74.0 2.8	59.25 .03	55.3 0.7
19.0	7.68 +.03	48.6 +1.5	53.22 +.01	18.6 −1.1	45.70 −.12	71.1 −3.0	59.23 −.01	54.6 −0.6
Mar. 1.0	7.73 .06	47.0 1.7	53.25 .05	17.5 1.0	45.63 −.02	68.1 3.0	59.24 +.03	54.1 0.4
11.0	7.81 .10	45.1 1.9	53.32 .08	16.6 0.7	45.66 +.08	65.0 3.0	59.28 .06	53.8 −0.2
21.0	7.93 .14	43.1 2.0	53.42 .12	16.0 0.5	45.80 .19	62.1 2.8	59.36 .10	53.7 0.0
30.9	8.09 .18	41.0 2.2	53.56 .16	15.7 −0.2	46.04 .29	59.4 2.5	59.47 .13	53.9 +0.3
Apr. 9.9	8.28 +.21	38.8 +2.2	53.74 +.20	15.7 +0.2	46.37 +.38	57.1 −2.1	59.63 +.17	54.3 +0.6
19.9	8.52 .25	36.5 2.3	53.95 .23	16.1 0.5	46.80 .47	55.2 1.7	59.81 .21	55.0 0.8
29.9	8.78 .28	34.2 2.3	54.20 .25	16.8 0.9	47.30 .54	53.8 1.2	60.04 .24	56.1 1.2
May 9.8	9.08 .31	32.0 2.2	54.47 .28	17.8 1.2	47.87 .59	52.9 −0.6	60.29 .27	57.4 1.4
19.8	9.39 .33	29.9 2.1	54.76 .30	19.2 1.5	48.49 .63	52.6 0.0	60.57 .29	58.9 1.6
29.8	9.73 +.34	27.9 +1.9	55.07 +.31	20.9 +1.8	49.12 +.65	52.9 +0.6	60.87 +.30	60.7 +1.8
June 8.7	10.07 .34	26.1 1.7	55.38 .32	22.8 2.0	49.78 .65	53.8 1.1	61.17 .31	62.6 2.0
18.7	10.42 .34	24.5 1.4	55.70 .31	24.8 2.1	50.42 .62	55.1 1.6	61.48 .31	64.6 2.1
28.7	10.75 .33	23.2 1.1	56.00 .30	27.0 2.2	51.03 .60	57.1 2.2	61.79 .30	66.7 2.1
July 8.7	11.07 .30	22.3 0.8	56.29 .27	29.3 2.3	51.60 .55	59.4 2.6	62.08 .28	68.8 2.1
18.6	11.36 +.27	21.6 +0.4	56.55 +.25	31.6 +2.3	52.12 +.48	62.2 +2.9	62.36 +.26	70.8 +2.0
28.6	11.61 .24	21.4 +0.1	56.78 .21	33.9 2.2	52.57 .41	65.2 3.1	62.60 .22	72.7 1.8
Aug. 7.6	11.83 .19	21.4 −0.2	56.98 .17	36.0 2.1	52.94 .33	68.6 3.4	62.81 .19	74.5 1.7
17.6	12.00 .14	21.8 0.6	57.13 .13	38.1 2.0	53.23 .25	72.1 3.6	62.96 .15	76.1 1.5
27.5	12.12 .10	22.5 0.8	57.24 .09	40.0 1.8	53.44 .16	75.8 3.7	63.12 .11	77.5 1.3
Sept. 6.5	12.19 +.05	23.5 −1.1	57.31 +.05	41.6 +1.6	53.55 +.07	79.4 +3.7	63.21 +.07	78.7 +1.1
16.5	12.22 .00	24.7 1.3	57.34 +.01	43.1 1.3	53.57 −.02	83.0 3.6	63.26 +.04	79.6 0.8
26.4	12.19 −.04	26.0 1.4	57.33 −.03	44.3 1.1	53.51 .10	86.6 3.4	63.28 .00	80.3 0.6
Oct. 6.4	12.13 .08	27.4 1.4	57.29 .06	45.3 0.9	53.37 .18	89.9 3.2	63.26 −.03	80.8 0.4
16.4	12.08 .11	28.8 1.4	57.22 .08	46.0 0.6	53.15 .25	93.0 2.9	63.22 .06	81.1 +0.2
26.4	11.91 −.14	30.2 −1.3	57.13 −.10	46.4 +0.3	52.87 −.32	95.7 +2.5	63.14 −.08	81.1 0.0
Nov. 5.3	11.76 .15	31.5 1.2	57.02 .12	46.6 +0.1	52.52 .37	98.0 2.1	63.05 .10	81.0 −0.2
15.3	11.61 .16	32.6 1.0	56.89 .13	46.6 −0.2	52.13 .42	99.8 1.6	62.95 .11	80.7 0.4
25.3	11.45 .16	33.5 0.8	56.77 .13	46.3 0.4	51.70 .45	101.2 1.1	62.83 .12	80.2 0.5
Dec. 5.3	11.29 −.15	34.2 −0.5	56.64 −.13	45.8 −0.6	51.24 −.47	102.0 +0.5	62.71 −.12	79.7 −0.6
15.2	11.14 .14	34.6 −0.2	56.51 .13	45.1 0.8	50.76 .47	102.1 −0.1	62.59 .12	79.0 0.8
25.2	11.01 .12	34.6 +0.1	56.38 .11	44.2 1.0	50.29 .46	101.7 0.7	62.48 .11	78.2 0.8
35.2	10.89 −.10	34.4 +0.4	56.29 −.10	43.1 −1.2	49.83 −.45	100.7 −1.3	62.38 −.10	77.3 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Piscium.		γ Cephei.		Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 23 33	° ′ +4 59	h m 23 34	° ′ +76 58	h m 23 49	° ′ +73 45	h m 23 53	° ′ +6 12
	s	″	s	″	s	″	s	″
Jan. 0.2	53.54 -.10	19.8 -0.8	30.96 -.85	51.1 -0.6	7.14 -.67	38.7 -0.4	15.92 -.11	43.4 -0.8
10.2	53.44 .10	19.0 0.8	30.13 .81	50.2 1.2	6.48 .64	37.9 1.1	15.81 .10	42.6 0.8
20.2	53.35 .08	18.1 0.8	29.35 .73	48.8 1.8	5.86 .59	36.5 1.6	15.72 .09	41.8 0.8
30.1	53.28 .06	17.3 0.8	28.67 .62	46.7 2.3	5.30 .51	34.6 2.1	15.63 .08	40.9 0.8
Feb. 9.1	53.22 .04	16.6 0.7	28.11 .49	44.2 2.7	4.84 .42	32.3 2.5	15.56 .06	40.2 0.7
19.1	53.19 -.02	15.9 -0.6	27.69 -.34	41.4 -2.9	4.47 -.30	29.6 -2.8	15.51 -.03	39.5 -0.6
Mar. 1.1	53.19 +.01	15.4 0.4	27.44 -.17	38.4 3.1	4.24 .17	26.6 3.0	15.49 -.01	39.0 0.4
11.0	53.22 .05	15.2 -0.2	27.36 +.01	35.3 3.1	4.14 -.03	23.6 3.1	15.50 +.03	38.6 -0.2
21.0	53 29 .08	15.1 +0.1	27.47 .20	32.2 3.0	4.19 +.12	20.5 3.0	15.55 .06	38.5 0.0
31.0	53.39 .12	15.3 0.3	27.76 .38	29.2 2.8	4.38 .27	17.6 2.8	15.63 .10	38.6 +0.2
Apr. 9.9	53.53 +.16	15.8 +0.6	28.22 +.54	26.6 -2.5	4.72 +.41	14.9 -2.5	15.75 +.14	39.0 +0.5
19.9	53.71 .20	16.5 0.9	28.83 .69	24.2 2.1	5.19 .53	12.5 2.1	15.92 .18	39.7 0.8
29.9	53.93 .23	17.5 1.2	29.59 .82	22.4 1.6	5.78 .64	10.6 1.7	16.12 .21	40.6 1.1
May 9.9	54.18 .26	18.8 1.4	30.46 .92	21.0 1.1	6.47 .73	9.1 1.2	16.35 .25	41.9 1.3
19.8	54.45 .28	20.4 1.6	31.42 .99	20.2 -0.5	7.24 .80	8.2 0.6	16.62 .27	43.3 1.6
29.8	54.74 +.30	22.1 +1.8	32.43+1.03	20.0 +0.1	8.06 +.84	7.9 -0.1	16.90 +.30	45.0 +1.8
June 8.8	55.05 .31	24.0 2.0	33.47 1.04	20.3 0.6	8.92 .86	8.1 +0.5	17.21 .31	46.8 1.9
18.7	55.36 .31	26.0 2.1	34.51 1.02	21.2 1.2	9.78 .86	9.0 1.1	17.52 .31	48.8 2.0
28.7	55.67 .30	28.1 2.0	35.51 .98	22.7 1.7	10.63 .83	10.3 1.6	17.83 .31	50.8 2.0
July 8.7	55.97 .29	30.1 2.0	36.46 .91	24.7 2.2	11.44 .78	12.1 2.1	18.13 .30	52.9 2.0
18.7	56.25 +.27	32.1 +1.9	37.33 +.82	27.1 +2.6	12.19 +.72	14.4 +2.5	18.42 +.28	54.9 +2.0
28.6	56.50 .24	34.0 1.8	38.10 .72	30.0 3.0	12.86 .63	17.2 2.9	18.68 .25	56.8 1.9
Aug. 7.6	56.72 .20	35.7 1.6	38.75 .59	33.1 3.3	13.45 .54	20.2 3.2	18.92 .22	58.6 1.7
17.6	56.90 .17	37.3 1.5	39.28 .46	36.5 3.5	13.94 .44	23.5 3.4	19.12 .18	60.2 1.5
27.6	57.05 .13	38.6 1.2	39.67 .32	40.2 3.7	14.32 .32	27.1 3.6	19.28 .14	61.6 1.3
Sept. 6.5	57.15 +.09	39.7 +1.0	39.92 +.18	43.9 +3.8	14.59 +.21	30.7 +3.7	19.41 +.11	62.9 +1.1
16.5	57.22 .05	40.6 0.8	40.03 +.08	47.7 3.8	14.74 +.09	34.4 3.7	19.49 .07	63.8 0.9
26.5	57.25 +.01	41.3 0.6	39.98 -.11	51.4 3.7	14.78 -.02	38.1 3.6	19.54 +.03	64.6 0.6
Oct. 6.4	57.24 -.02	41.7 0.3	39.80 .25	55.0 3.5	14.70 .14	41.7 3.5	19.56 .00	65.1 0.4
16.4	57.21 .05	41.9 +0.1	39.49 .38	58.4 3.3	14.51 .24	45.1 3.3	19.54 -.03	65.4 +0.2
26.4	57.15 -.07	41.9 -0.1	39.04 -.50	61.5 +3.0	14.22 -.34	48.3 +3.0	19.49 -.06	65.4 0.0
Nov. 5.4	57.06 .09	41.8 0.2	38.48 .61	64.3 2.6	13.83 .44	51.1 2.6	19.43 .08	65.3 -0.2
15.3	56.97 .10	41.4 0.4	37.82 .71	66.7 2.1	13.35 .52	53.5 2.2	19.34 .09	65.1 0.3
25.3	56.86 .11	41.0 0.5	37.07 .78	68.5 1.6	12.80 .58	55.4 1.7	19.24 .10	64.6 0.5
Dec. 5.3	56.75 -.12	40.4 -0.6	36.26 -.84	69.8 +1.0	12.19 -.64	56.8 +1.1	19.13 -.11	64.1 -0.6
15.3	56.63 .12	39.7 0.7	35.40 .87	70.5 +0 4	11.53 .67	57.6 +0.5	19.02 .12	63.4 0.7
25.2	56.52 .11	38.9 0.8	34.52 .87	70.6 -0.2	10.86 .68	57.8 -0.1	18.90 .11	62.7 0.8
35.2	56.41 -.10	38.1 -0.8	33.66 -.85	70.0 -0.9	10.18 -.66	57.4 -0.7	18.79 -.11	61.9 -0.8

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 48 58.51	59.24	−22 58 32.9	32.1	11.029	+12.90	+ 3 59.51	16 18.39	1 11.06	18 44 59.07
2	18 53 23.03	23.85	22 53 9.6	8.5	11.014	14.04	4 27.48	16 18.38	1 11.02	18 48 55.63
3	18 57 47.16	48.07	22 47 19.1	17.8	10.997	15.17	4 55.06	16 18.38	1 10.97	18 52 52.19
4	19 2 10.90	11.89	22 41 1.5	0.0	10.980	16.30	5 22.24	16 18.36	1 10.91	18 56 48.75
5	19 6 34.20	35.27	22 34 16.9	15.2	10.961	17.42	5 48.99	16 18.34	1 10.85	19 0 45.31
6	19 10 57.05	58.20	−22 27 5.5	3.5	10.942	+18.53	+ 6 15.30	16 18.31	1 10.79	19 4 41.86
7	19 15 19.43	20.65	22 19 27.6	25.3	10.922	19.63	6 41.13	16 18.28	1 10.72	19 8 38.42
8	19 19 41.31	42.60	22 11 23.3	20.8	10.901	20.72	7 6.46	16 18.25	1 10.65	19 12 34.98
9	19 24 2.67	4.03	22 2 52.9	50.1	10.879	21.80	7 31.26	16 18.20	1 10.57	19 16 31.54
10	19 28 23.49	24.92	21 53 56.7	53.6	10.856	22.88	7 55.53	16 18.15	1 10.49	19 20 28.09
11	19 32 43.75	45.25	−21 44 34.7	31.3	10.832	+23.94	+ 8 19.23	16 18.10	1 10.41	19 24 24.65
12	19 37 3.42	4.98	21 34 47.3	43.6	10.807	24.99	8 42.35	16 18.04	1 10.33	19 28 21.21
13	19 41 22.48	24.10	21 24 34.9	30.9	10.781	26.03	9 4.86	16 17.97	1 10.24	19 32 17.77
14	19 45 40.91	42.59	21 13 57.7	53.4	10.755	27.06	9 26.73	16 17.90	1 10.15	19 36 14.32
15	19 49 58.70	60.44	21 2 56.0	51.4	10.727	28.07	9 47.96	16 17.82	1 10.06	19 40 10.88
16	19 54 15.82	17.62	−20 51 30.1	25.2	10.699	+29.07	+10 8.53	16 17.74	1 9.96	19 44 7.43
17	19 58 32.24	34.10	20 39 40.4	35.2	10.670	30.05	10 28.40	16 17.66	1 9.86	19 48 3.99
18	20 2 47.96	49.87	20 27 27.2	21.6	10.640	31.03	10 47.55	16 17.57	1 9.76	19 52 0.55
19	20 7 2.94	4.90	20 14 50.9	45.0	10.609	31.98	11 5.97	16 17.48	1 9.66	19 55 57.11
20	20 11 17.18	19.19	20 1 51.7	45.4	10.577	32.93	11 23.65	16 17.39	1 9.56	19 59 53.66
21	20 15 30.65	32.70	−19 48 30.1	23.5	10.545	+33.85	+11 40.56	16 17.29	1 9.46	20 3 50.22
22	20 19 43.34	45.43	19 34 46.5	39.6	10.512	34.77	11 56.69	16 17.19	1 9.35	20 7 46.77
23	20 23 55.24	57.37	19 20 41.2	34.0	10.479	35.66	12 12.03	16 17.09	1 9.24	20 11 43.33
24	20 28 6.33	8.50	19 6 14.6	7.0	10.445	36.54	12 26.56	16 16.98	1 9.13	20 15 39.89
25	20 32 16.61	18.81	18 51 27.1	19.2	10.411	37.40	12 40.27	16 16.86	1 9.02	20 19 36.45
26	20 36 26.06	28.29	−18 36 19.2	10.9	10.377	+38.25	+12 53.17	16 16.74	1 8.91	20 23 33.00
27	20 40 34.69	36.94	18 20 51.1	42.5	10.342	39.08	13 5.24	16 16.62	1 8.80	20 27 29.56
28	20 44 42.48	44.75	18 4 63.2	54.3	10.307	39.90	13 16.47	16 16.50	1 8.68	20 31 26.11
29	20 48 49.43	51.72	17 48 56.0	46.8	10.272	40.69	13 26.85	16 16.37	1 8.57	20 35 22.67
30	20 52 55.55	57.86	17 32 29.7	20.2	10.238	41.48	13 36.41	16 16.23	1 8.45	20 39 19.22
31	20 57 0.84	3.17	−17 15 44.9	35.1	10.203	+42.23	+13 45.14	16 16.09	1 8.34	20 43 15.78
Feb. 1	21 1 5.29	7.64	16 58 41.9	31.9	10.168	42.98	13 53.03	16 15.95	1 8.22	20 47 12.33
2	21 5 8.91	11.28	16 41 21.1	10.8	10.134	43.72	14 0.09	16 15.80	1 8.11	20 51 8.89
3	21 9 11.71	14.10	16 23 42.9	32.4	10.100	44.45	14 6.33	16 15.64	1 7.99	20 55 5.44
4	21 13 13.70	16.09	16 5 47.6	36.9	10.066	45.14	14 11.75	16 15.48	1 7.88	20 59 2.00
5	21 17 14.88	17.27	−15 47 35.7	24.8	10.033	+45.83	+14 16.37	16 15.31	1 7.76	21 2 58.55
6	21 21 15.26	17.65	15 28 67.5	56.4	10.000	46.50	14 20.18	16 15.13	1 7.65	21 6 55.11
7	21 25 14.84	17.23	15 10 23.4	12.1	9.967	47.16	14 23.20	16 14.95	1 7.53	21 10 51.66
8	21 29 13.64	16.03	14 51 23.9	12.4	9.934	47.79	14 25.43	16 14.77	1 7.42	21 14 48.22
9	21 33 11.66	14.05	14 31 69.3	57.7	9.902	48.41	14 26.91	16 14.59	1 7.31	21 18 44.77
10	21 37 8.92	11.30	−14 12 40.1	28.3	9.870	+49.00	+14 27.61	16 14.40	1 7.20	21 22 41.33
11	21 41 5.43	7.80	13 52 56.7	44.8	9.839	49.58	14 27.55	16 14.20	1 7.09	21 26 37.88
12	21 45 1.19	3.55	13 32 59.5	47.4	9.808	50.15	14 26.75	16 14.01	1 6.98	21 30 34.44
13	21 48 56.21	58.56	13 12 48.9	36.7	9.777	50.71	14 25.22	16 13.81	1 6.87	21 34 30.99
14	21 52 50.51	52.85	12 52 25.4	13.1	9.747	51.23	14 22.95	16 13.61	1 6.76	21 38 27.54
15	21 56 44.09	46.41	−12 31 49.3	36.9	9.717	+51.75	+14 19.96	16 13.40	1 6.64	21 42 24.09
16	22 0 36.95	39.25	−12 10 61.2	48.7	9.687	+52.24	+14 16.26	16 13.20	1 6.55	21 46 20.65

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 16	22 0 36.95	39.25	−12 10 61.2	48.7	9.687	+52.94	+14 16.26	16 13.20	1 6.55	21 46 20.65
17	22 4 29.09	31.38	11 49 61.5	49.0	9.658	52.72	14 11.85	16 12.99	1 6.45	21 50 17.20
18	22 8 20.55	22.82	11 28 50.6	38.1	9.629	53.17	14 6.74	16 12.77	1 6.35	21 54 13.76
19	22 12 11.32	13.57	11 7 28.9	16.4	9.601	53.62	14 0.95	16 12.55	1 6.25	21 58 10.31
20	22 16 1.42	3.65	10 45 56.9	44.4	9.573	54.03	13 54.49	16 12.34	1 6.15	22 2 6.87
21	22 19 50.86	53.06	−10 24 15.0	2.5	9.546	+54.44	+13 47.37	16 12.12	1 6.06	22 6 3.42
22	22 23 39.65	41.82	10 2 23.6	11.2	9.519	54.82	13 39.60	16 11.90	1 5.97	22 9 59.98
23	22 27 27.80	29.94	9 40 23.1	10.7	9.493	55.20	13 31.19	16 11.68	1 5.88	22 13 56.52
24	22 31 15.33	17.44	9 18 14.0	1.6	9.468	55.54	13 22.17	16 11.46	1 5.79	22 17 53.08
25	22 35 2.25	4.33	8 55 56.7	44.4	9.443	55.88	13 12.53	16 11.23	1 5.71	22 21 49.63
26	22 38 48.58	50.63	− 8 33 31.5	19.3	9.419	+56.19	+13 2.30	16 11.00	1 5.63	22 25 46.19
27	22 42 34.33	36.34	8 10 59.0	46.9	9.395	56.50	12 51.51	16 10.76	1 5.55	22 29 42.73
28	22 46 19.53	21.51	7 48 19.3	7.3	9.372	56.78	12 40.16	16 10.53	1 5.48	22 33 39.29
Mar. 1	22 50 4.19	6.13	7 25 33.0	21.1	9.350	57.06	12 28.26	16 10.29	1 5.41	22 37 35.84
2	22 53 48.35	50.26	7 2 40.4	28.6	9.329	57.31	12 15.86	16 10.05	1 5.34	22 41 32.40
3	22 57 32.01	33.88	− 6 39 41.7	30.1	9.309	+57.55	+12 2.97	16 9.81	1 5.27	22 45 28.95
4	23 1 15.21	17.04	6 16 37.6	26.1	9.290	57.77	11 49.60	16 9.56	1 5.20	22 49 25.50
5	23 4 57.95	59.74	5 53 28.2	16.9	9.272	57.99	11 35.80	16 9.30	1 5.13	22 53 22.05
6	23 8 40.27	42.02	5 30 14.0	2.9	9.255	58.18	11 21.57	16 9.04	1 5.07	22 57 18.61
7	23 12 22.19	23.90	5 6 55.3	44.5	9.239	58.36	11 6.94	16 8.78	1 5.01	23 1 15.15
8	23 16 3.74	5.41	− 4 43 32.5	21.9	9.224	+58.52	+10 51.93	16 8.52	1 4.95	23 5 11.71
9	23 19 44.93	46.56	4 19 65.9	55.6	9.209	58.68	10 36.56	16 8.26	1 4.90	23 9 8.26
10	23 23 25.79	27.38	3 56 36.0	25.9	9.196	58.80	10 20.86	16 7.99	1 4.85	23 13 4.82
11	23 27 6.34	7.89	3 32 63.1	53.2	9.183	58.92	10 4.86	16 7.72	1 4.81	23 17 1.37
12	23 30 46.61	48.12	3 9 27.6	17.9	9.172	59.02	9 48.59	16 7.45	1 4.76	23 20 57.93
13	23 34 26.60	28.06	− 2 45 49.9	40.5	9.161	+59.11	+ 9 32.04	16 7.18	1 4.72	23 24 54.47
14	23 38 6.34	7.76	2 22 10.3	1.1	9.151	59.17	9 15.21	16 6.91	1 4.68	23 28 51.03
15	23 41 45.84	47.21	1 58 29.2	20.3	9.142	59.23	8 58.15	16 6.64	1 4.65	23 32 47.59
16	23 45 25.14	26.47	1 34 47.1	38.4	9.134	59.26	8 40.89	16 6.37	1 4.61	23 36 44.14
17	23 49 4.24	5.52	1 10 64.3	55.9	9.126	59.28	8 23.46	16 6.09	1 4.58	23 40 40.68
18	23 52 43.17	44.41	− 0 47 21.3	13.3	9.119	+59.29	+ 8 5.84	16 5.82	1 4.56	23 44 37.24
19	23 56 21.93	23.12	− 0 23 38.3	30.6	9.112	59.28	7 48.04	16 5.55	1 4.54	23 48 33.78
20	0 0 0.55	1.69	+ 0 0 4.3	11.7	9.106	59.25	7 30.10	16 5.28	1 4.52	23 52 30.34
21	0 3 39.04	40.13	0 23 46.1	53.2	9.101	59.21	7 12.05	16 5.00	1 4.50	23 56 26.90
22	0 7 17.42	18.46	0 47 26.5	33.3	9.097	59.15	6 53.90	16 4.73	1 4.49	0 0 23.45
23	0 10 55.71	56.71	+ 1 11 5.4	11.9	9.094	+59.08	+ 6 35.64	16 4.46	1 4.48	0 4 20.00
24	0 14 33.92	34.87	1 34 42.2	48.4	9.091	58.98	6 17.30	16 4.19	1 4.47	0 8 16.55
25	0 18 12.07	12.98	1 58 16.7	22.6	9.089	58.88	5 58.90	16 3.92	1 4.46	0 12 13.10
26	0 21 50.18	51.05	2 21 48.5	54.1	9.088	58.75	5 40.45	16 3.65	1 4.46	0 16 9.65
27	0 25 28.28	29.10	2 45 17.3	22.6	9 087	58.63	5 21.99	16 3.38	1 4.46	0 20 6.21
28	0 29 6.37	7.14	+ 3 8 42.7	47.7	9.088	+58.48	+ 5 3.54	16 3.11	1 4.46	0 24 2.76
29	0 32 44.49	45.21	3 32 4.3	8.9	9.089	58.32	4 45.11	16 2.83	1 4.47	0 27 59.31
30	0 36 22.64	23.31	3 55 21.9	26.2	9.092	58.14	4 26.72	16 2.56	1 4.48	0 31 55.86
31	0 40 0.86	1.49	4 18 35.1	39 2	9.095	57.95	4 8.40	16 2.29	1 4.49	0 35 52.41
32	0 43 39.17	39.75	4 41 43.5	47.2	9.099	57.74	3 50.16	16 2.02	1 4.51	0 39 48.97
33	0 47 17.59	18.13	+ 5 4 46.9	50.3	9.104	+57.53	+ 3 32.03	16 1.74	1 4.53	0 43 45.52
34	0 50 56.14	56.63	+ 5 27 45.0	48.1	9.110	+57.30	+ 3 14.03	16 1.46	1 4.55	0 47 42.07

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
April 1	0 43 39.17	39.75	+ 4 41 43.5	47.2	9.099	+57.74	+ 3 50.16	16 2.02	1 4.51	0 39 48.97
2	0 47 17.59	18.13	5 4 46.9	50.3	9.104	57.53	3 32.03	16 1.74	1 4.53	0 43 45.52
3	0 50 56.14	56.63	5 27 45.0	48.1	9.110	57.30	3 14.03	16 1.46	1 4.55	0 47 42.07
4	0 54 34.84	35.29	5 50 37.4	40.2	9.116	57.06	2 56.18	16 1.19	1 4.58	0 51 38.62
5	0 58 13.72	14.12	6 13 23.7	26.2	9.124	56.80	2 38.50	16 0.91	1 4.61	0 55 35.18
6	1 1 52.79	53.15	+ 6 36 3.7	5.9	9.133	+56.53	+ 2 21.03	16 0.64	1 4.64	0 59 31.73
7	1 5 32.09	32.40	6 58 37.0	38.9	9.143	56.25	2 3.78	16 0.36	1 4.67	1 3 28.28
8	1 9 11.63	11.90	7 21 3.3	4.9	9.153	55.94	1 46 77	16 0.08	1 4.71	1 7 24.83
9	1 12 51.43	51.66	7 43 22.3	23.6	9.164	55.63	1 30.03	15 59.80	1 4.74	1 11 21.39
10	1 16 31.51	31.70	8 5 33.4	34.5	9.176	55.30	1 13.57	15 59.52	1 4.78	1 15 17.94
11	1 20 11.89	12.04	+ 8 27 36.6	37.4	9.189	+54.96	+ 0 57.40	15 59.24	1 4.82	1 19 14.49
12	1 23 52.58	52.69	8 49 31.4	32.0	9.202	54.60	0 41.54	15 58.97	1 4.87	1 23 11.04
13	1 27 33.59	33.66	9 11 17.5	17.9	9.216	54.23	0 26.01	15 58.69	1 4.91	1 27 7.59
14	1 31 14.95	14.98	9 32 54.4	54.6	9.231	53.84	+ 0 10.81	15 58.42	1 4.96	1 31 4.15
15	1 34 56.67	56.66	9 54 22.0	22.0	9.246	53.44	− 0 4.03	15 58.15	1 5.01	1 35 0.71
16	1 38 38.76	38.71	+10 15 39.7	39.5	9.262	+53.03	− 0 18.50	15 57.89	1 5.07	1 38 57.26
17	1 42 21.23	21.15	10 36 47.3	46.9	9.278	52.60	0 32.58	15 57.62	1 5.12	1 42 53.81
18	1 46 4.09	3.97	10 57 44.4	43.8	9.294	52.15	0 46.26	15 57.36	1 5.18	1 46 50.36
19	1 49 47.35	47.19	11 18 30.6	29.9	9.311	51.69	0 59.55	15 57.11	1 5.24	1 50 46.92
20	1 53 31.01	30.82	11 39 5.7	4.8	9.328	51.22	1 12.44	15 56.86	1 5.30	1 54 43.47
21	1 57 15.10	14.88	+11 59 29.3	28.2	9.346	+50.73	− 1 24.92	15 56.60	1 5.36	1 58 40.03
22	2 0 59.62	59.36	12 19 41.0	39.7	9.364	50.23	1 36.95	15 56.35	1 5.43	2 2 36.58
23	2 4 44.58	44.29	12 39 40.5	39.1	9.383	49.72	1 48.54	15 56.10	1 5.49	2 6 33.14
24	2 8 30.00	29.68	12 59 27.5	25.9	9.402	49.19	1 59.68	15 55.86	1 5.56	2 10 29.69
25	2 12 15.87	15.53	13 18 61.7	59.9	9.421	48.65	2 10.36	15 55.61	1 5.63	2 14 26.24
26	2 16 2.21	1.84	+13 38 22.6	20.7	9.441	+48.09	− 2 20.56	15 55.37	1 5.70	2 18 22.79
27	2 19 49.02	48.62	13 57 30.1	28.1	9.461	47.52	2 30.30	15 55.13	1 5.77	2 22 19.35
28	2 23 36.31	35.89	14 16 23.7	21.6	9.481	46.94	2 39 55	15 54.89	1 5.85	2 26 15.90
29	2 27 24.11	23.67	14 35 3.2	1.0	9.503	46.35	2 48.31	15 54.65	1 5.93	2 30 12.46
30	2 31 12.44	11.98	14 53 28.3	26.1	9.524	45.74	2 56.54	15 54.42	1 6.01	2 34 9.01
May 1	2 35 1.29	0.81	+15 11 38.7	36.4	9.546	+45.12	− 3 4.25	15 54.18	1 6.09	2 38 5.57
2	2 38 50.67	50.17	15 29 34.1	31.8	9.569	44.49	3 11.43	15 53.95	1 6.17	2 42 2.12
3	2 42 40.60	40.08	15 47 14.2	11.8	9.592	43.84	3 18.06	15 53.72	1 6.25	2 45 58.68
4	2 46 31.09	30.55	16 4 38.6	36.2	9.616	43.18	3 24.13	15 53.49	1 6.33	2 49 55.23
5	2 50 22.15	21.59	16 21 47.1	44.7	9.639	42.52	3 29.63	15 53.26	1 6.41	2 53 51.79
6	2 54 13.78	13.21	+16 38 39.4	36.9	9.663	+41.84	− 3 34.55	15 53.03	1 6.49	2 57 48.34
7	2 58 5.98	5.40	16 55 15.3	12.8	9.687	41.14	3 38.90	15 52.80	1 6.57	3 1 44.90
8	3 1 58.77	58.17	17 11 34.2	31.7	9.712	40.43	3 42.66	15 52.58	1 6.66	3 5 41.45
9	3 5 52.15	51.54	17 27 36.0	33.5	9.737	39.71	3 45.85	15 52.36	1 6.74	3 9 38.01
10	3 9 46.13	45.51	17 43 20.3	17.8	9.762	38.98	3 48.43	15 52.14	1 6.82	3 13 34.56
11	3 13 40.71	40.08	+17 58 47.0	44.5	9.787	+38.24	− 3 50.40	15 51.93	1 6.90	3 17 31.12
12	3 17 35.89	35.25	18 13 55.6	53.2	9.811	37.48	3 51.79	15 51.72	1 6.99	3 21 27.67
13	3 21 31.65	31.01	18 28 45.9	43.5	9.836	36.71	3 52.58	15 51.51	1 7.07	3 25 24.23
14	3 25 28.00	27.36	18 43 17.6	15.3	9.860	35.93	3 52.78	15 51.31	1 7.15	3 29 20.78
15	3 29 24.93	24.29	18 57 30.4	28.1	9.884	35.13	3 52.40	15 51.11	1 7.23	3 33 17.34
16	3 33 22.44	21.80	+19 11 24.0	21.7	9.908	+34.32	− 3 51.45	15 50.91	1 7.31	3 37 13.89
17	3 37 20.52	19.88	+19 24 58.0	55.8	9.932	+33.50	− 3 49.93	15 50.72	1 7.39	3 41 10.45

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 37 20.52	19.88	+19 24 58.0	55.8	9.932	+33.50	− 3 49.93	15 50.72	1 7.39	3 41 10.45
18	3 41 19.16	18.52	19 38 12.4	10.3	9.955	32.68	3 47.84	15 50.54	1 7.47	3 45 7.00
19	3 45 18.35	17.72	19 51 6.7	4.7	9.978	31.84	3 45.21	15 50.35	1 7.55	3 49 3.56
20	3 49 18.09	17.47	20 3 40.8	38.9	10.000	30.99	3 42.04	15 50.17	1 7.63	3 53 0.12
21	3 53 18.36	17.75	20 15 54.3	52.4	10.022	30.13	3 38.33	15 50.00	1 7.71	3 56 56.68
22	3 57 19.14	18.54	+20 27 47.0	45.2	10.043	+29.26	− 3 34.09	15 49.83	1 7.77	4 0 53.23
23	4 1 20.42	19.83	20 39 18.7	17.0	10.064	28.37	3 29.30	15 49.67	1 7.85	4 4 49.79
24	4 5 22.20	21.62	20 50 29.1	27.5	10.084	27.48	3 24.15	15 49.51	1 7.92	4 8 46.34
25	4 9 24.47	23.90	21 1 18.0	16.5	10.104	26.58	3 18.44	15 49.35	1 7.99	4 12 42.90
26	4 13 27.21	26.66	21 11 45.3	43.9	10.124	25.67	3 12.25	15 49.20	1 8.06	4 16 39.45
27	4 17 30.42	29.89	+21 21 50.6	49.3	10.143	+24.75	− 3 5.60	15 49.05	1 8.13	4 20 36.01
28	4 21 34.08	33.57	21 31 33.7	32.5	10.162	23.83	2 58.50	15 48.90	1 8.19	4 24 32.57
29	4 25 38.18	37.69	21 40 54.5	53.4	10.180	22.89	2 50.96	15 48.75	1 8.26	4 28 29.13
30	4 29 42.72	42.25	21 49 52.7	51.7	10.198	21.95	2 42.98	15 48.61	1 8.32	4 32 25.68
31	4 33 47.68	47.24	21 58 28.2	27.3	10.215	21.00	2 34.57	15 48.47	1 8.38	4 36 22.24
June 1	4 37 53.05	52.64	+22 6 40.8	40.0	10.232	+20.05	− 2 25.75	15 48.34	1 8.44	4 40 18.79
2	4 41 58.82	58.43	22 14 30.4	29.6	10.248	19.08	2 16.55	15 48.21	1 8.49	4 44 15.35
3	4 46 4.97	4.61	22 21 56.7	56.0	10.264	18.11	2 6.96	15 48.08	1 8.54	4 48 11.91
4	4 50 11.49	11.15	22 28 59.6	59.0	10.279	17.13	1 57.00	15 47.95	1 8.59	4 52 8.47
5	4 54 18.36	18.05	22 35 38.9	38.4	10.293	16.14	1 46.67	15 47.83	1 8.64	4 56 5.02
6	4 58 25.58	25.30	+22 41 54.5	54.0	10.307	+15.15	− 1 36.01	15 47.71	1 8.68	5 0 1.58
7	5 2 33.12	32.87	22 47 46.2	45.8	10.321	14.16	1 25.03	15 47.59	1 8.72	5 3 58.14
8	5 6 40.97	40.75	22 53 14.0	13.7	10.333	13.16	1 13.75	15 47.48	1 8.76	5 7 54.70
9	5 10 49.10	48.91	22 58 17.6	17.4	10.344	12.15	1 2.17	15 47.37	1 8.80	5 11 51.25
10	5 14 57.50	57.35	23 2 57.0	56.9	10.355	11.14	0 50.32	15 47.26	1 8.83	5 15 47.81
11	5 19 6.14	6.03	+23 7 12.2	12.1	10.365	+10.12	− 0 38.24	15 47.16	1 8.86	5 19 44.37
12	5 23 15.00	14.92	23 11 2.8	2.8	10.373	9.10	0 25.94	15 47.06	1 8.88	5 23 40.93
13	5 27 24.04	24.00	23 14 29.0	29.0	10.380	8.08	0 13.44	15 46.97	1 8.90	5 27 37.48
14	5 31 33.25	33.24	23 17 30.6	30.6	10.386	7.05	− 0 0.79	15 46.89	1 8.92	5 31 34.04
15	5 35 42.61	42.64	23 20 7.5	7.5	10.392	6.02	+ 0 12.01	15 46.81	1 8.93	5 35 30.59
16	5 39 52.07	52.14	+23 22 19.7	19.7	10.396	+ 4.99	+ 0 24.92	15 46.74	1 8.95	5 39 27.15
17	5 44 1.63	1.73	23 24 7.3	7.3	10.399	3.96	0 37.93	15 46.67	1 8.96	5 43 23.71
18	5 48 11.24	11.38	23 25 30.1	30.1	10.401	2.93	0 51.00	15 46.61	1 8.97	5 47 20.27
19	5 52 20.89	21.07	23 26 28.1	28.1	10.402	1.90	1 4.08	15 46.55	1 8.97	5 51 16.82
20	5 56 30.54	30.76	23 27 1.3	1.3	10.401	+ 0.87	1 17.17	15 46.50	1 8.98	5 55 13.38
21	6 0 40.17	40.43	+23 27 9.7	9.7	10.400	− 0.17	+ 1 30.23	15 46.45	1 8.98	5 59 9.94
22	6 4 49.74	50.04	23 26 53.3	53.3	10.397	1.20	1 43.25	15 46.41	1 8.97	6 3 6.50
23	6 8 59.24	59.57	23 26 12.2	12.1	10.394	2.23	1 56.20	15 46.37	1 8.96	6 7 3.05
24	6 13 8.63	9.00	23 25 6.4	6.3	10.389	3.26	2 9.03	15 46.34	1 8.95	6 10 59.61
25	6 17 17.90	18.31	23 23 35.8	35.6	10.383	4.29	2 21.75	15 46.31	1 8.94	6 14 56.17
26	6 21 27.03	27.48	+23 21 40.6	40.4	10.377	− 5.32	+ 2 34.33	15 46.29	1 8.92	6 18 52.73
27	6 25 36.00	36.48	23 19 20.8	20.5	10.370	6.34	2 46.74	15 46.27	1 8.90	6 22 49.28
28	6 29 44.79	45.31	23 16 36.5	36.2	10.362	7.36	2 58.97	15 46.25	1 8.87	6 26 45.84
29	6 33 53.38	53.93	23 13 27.7	27.3	10.353	8.38	3 11.01	15 46.23	1 8.84	6 30 42.40
30	6 38 1.74	2.33	23 9 54.4	53.9	10.343	9.40	3 22.82	15 46.22	1 8.81	6 34 38.96
31	6 42 9.87	10.49	+23 5 56.7	56.1	10.333	−10.41	+ 3 34.38	15 46.21	1 8.77	6 38 35.51
32	6 46 17.74	18.39	+23 1 34.9	34.1	10.322	−11.42	+ 3 45.69	15 46.20	1 8.73	6 42 32.07

Note.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 42 9.87	10.49	+23 5 56.7	56.1	10.333	−10.41	+ 3 34.38	15 46.21	1 8.77	6 38 35.51
2	6 46 17.74	18.39	23 1 34.9	34.1	10.322	11.42	3 45.69	15 46.20	1 8.73	6 42 32.07
3	6 50 25.33	26.01	22 56 48.9	48.1	10.310	12.42	3 56.73	15 46.20	1 8.69	6 46 28.63
4	6 54 32.63	33.34	22 51 38.9	38.0	10.298	13.41	4 7.48	15 46.20	1 8.65	6 50 25.19
5	6 58 39.63	40.37	22 46 5.0	4.0	10.285	14.41	4 17.92	15 46.21	1 8.61	6 54 21.74
6	7 2 46.31	47.08	+22 40 7.3	6.2	10.271	−15.40	+ 4 28.04	15 46.22	1 8.56	6 58 18.30
7	7 6 52.65	53.45	22 33 46.0	44.8	10.257	16.38	4 37.82	15 46.23	1 8.51	7 2 14.86
8	7 10 58.63	59.46	22 26 61.2	59.9	10.241	17.35	4 47.24	15 46.25	1 8.46	7 6 11.42
9	7 15 4.23	5.07	22 19 53.1	51.7	10.225	18.32	4 56.28	15 46.27	1 8.40	7 10 7.97
10	7 19 9.43	10.29	22 12 21.8	20.3	10.208	19.28	5 4.92	15 46.30	1 8.34	7 14 4.53
11	7 23 14.21	15.09	+22 4 27.5	25.8	10.190	−20.23	+ 5 13.14	15 46.33	1 8.28	7 18 1.09
12	7 27 18.56	19.46	21 56 10.5	8.6	10.172	21.17	5 20.94	15 46.37	1 8.22	7 21 57.65
13	7 31 22.46	23.38	21 47 30.8	28.9	10.153	22.11	5 28.29	15 46.41	1 8.15	7 25 54.20
14	7 35 25.89	26.83	21 38 28.8	26.8	10.133	23.04	5 35.16	15 46.45	1 8.08	7 29 50.76
15	7 39 28.84	29.80	21 29 4.6	2.4	10.112	23.96	5 41.55	15 46.50	1 8.01	7 33 47.31
16	7 43 31.29	32.27	+21 19 18.5	16.2	10.091	−24.87	+ 5 47.44	15 46.56	1 7.94	7 37 43.87
17	7 47 33.22	34.21	21 9 10.6	8.2	10.069	25.77	5 52.81	15 46.63	1 7.86	7 41 40.42
18	7 51 34.62	35.62	20 58 41.3	38.8	10.046	26.66	5 57.65	15 46.70	1 7.78	7 45 36.98
19	7 55 35.46	36.47	20 47 50.7	48.0	10.023	27.54	6 1.93	15 46.78	1 7.70	7 49 33.54
20	7 59 35.74	36.75	20 36 39.2	36.4	9.999	28.41	6 5.65	15 46.86	1 7.62	7 53 30.10
21	8 3 35.44	36.46	+20 25 6.9	4.0	9.975	−29.27	+ 6 8.80	15 46.95	1 7.54	7 57 26.66
22	8 7 34.55	35.58	20 13 14.2	11.2	9.951	30.12	6 11.36	15 47.04	1 7.46	8 1 23.21
23	8 11 33.07	34.10	20 0 61.2	58.0	9.926	30.96	6 13.33	15 47.13	1 7.38	8 5 19.76
24	8 15 31.00	32.03	19 48 28.3	25.0	9.901	31.78	6 14.69	15 47.23	1 7.30	8 9 16.32
25	8 19 28.33	29.36	19 35 35.6	32.2	9.876	32.60	6 15.46	15 47.33	1 7.22	8 13 12.87
26	8 23 25.04	26.07	+19 22 23.4	19.9	9.851	−33.40	+ 6 15.62	15 47.43	1 7.14	8 17 9.43
27	8 27 21.15	22.18	19 8 51.9	48.4	9.825	34.20	6 15.17	15 47.54	1 7.05	8 21 5.99
28	8 31 16.65	17.68	18 54 61.6	58.0	9.800	34.98	6 14.11	15 47.65	1 6.97	8 25 2.55
29	8 35 11.54	12.56	18 40 52.5	48.8	9.774	35.76	6 12.45	15 47.77	1 6.88	8 28 59.10
30	8 39 5.83	6.84	18 26 25.0	21.3	9.749	36.52	6 10.17	15 47.89	1 6.80	8 32 55.66
31	8 42 59.51	60.51	+18 11 39.3	35.5	9.724	−37.28	+ 6 7.29	15 48.01	1 6.71	8 36 52.21
Aug. 1	8 46 52.59	53.58	17 56 35.7	31.9	9.699	38.02	6 3.82	15 48.13	1 6.63	8 40 48.77
2	8 50 45.07	46.05	17 41 14.5	10.6	9.675	38.75	5 59.75	15 48.26	1 6.54	8 44 45.32
3	8 54 36.97	37.93	17 25 35.9	32.0	9.650	39.46	5 55.08	15 48.39	1 6.45	8 48 41.88
4	8 58 28.27	29.21	17 9 40.3	36.4	9.626	40.17	5 49.83	15 48.52	1 6.36	8 52 38.43
5	9 2 19.00	19.92	+16 53 27.8	23.9	9.602	−40.86	+ 5 44.00	15 48.66	1 6.28	8 56 34.99
6	9 6 9.15	10.05	16 36 58.9	54.9	9.578	41.54	5 37.59	15 48.80	1 6.19	9 0 31.54
7	9 9 58.72	59.60	16 20 13.7	9.8	9.554	42.20	5 30.60	15 48.94	1 6.10	9 4 28.10
8	9 13 47.72	48.58	16 3 12.8	8.9	9.530	42.86	5 23.08	15 49.08	1 6.01	9 8 24.65
9	9 17 36.15	36.99	15 45 56.2	52.3	9.506	43.50	5 14.92	15 49.23	1 5.93	9 12 21.21
10	9 21 24.03	24.84	+15 28 24.5	20.7	9.483	−44.13	+ 5 6.25	15 49.39	1 5.85	9 16 17.76
11	9 25 11.35	12.13	15 10 37.8	34.1	9.460	44.74	4 57.01	15 49.55	1 5.77	9 20 14.32
12	9 28 58.12	58.87	14 52 36.5	32.9	9.437	45.35	4 47.22	15 49.72	1 5.68	9 24 10.87
13	9 32 44.34	45.06	14 34 20.9	17.4	9.414	45.93	4 36.88	15 49.89	1 5.60	9 28 7.43
14	9 36 30.02	30.71	14 15 51.4	48.0	9.392	46.51	4 26.00	15 50.07	1 5.52	9 32 3.99
15	9 40 15.16	15.82	+13 57 8.2	4.9	9.370	−47.07	+ 4 14.59	15 50.24	1 5.44	9 36 0.54
16	9 43 59.76	60.39	+13 38 11.7	8.5	9.348	−47.62	+ 4 2.65	15 50.42	1 5.36	9 39 57.09

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug.16	9 43 59.76	60.39	+13 38 11.7	8.5	9.348	−47.62	+ 4 2.65	15 50.42	1 5.36	9 39 57.09
17	9 47 43.84	44.43	13 18 62.3	59.2	9.326	48.15	3 50.18	15 50.61	1 5.29	9 43 53.64
18	9 51 27.40	27.96	12 59 40.3	37.3	9.304	48.67	3 37.19	15 50.81	1 5.22	9 47 50.19
19	9 55 10.45	10.98	12 40 6.0	3.1	9.283	49.17	3 23.68	15 51.00	1 5.15	9 51 46.74
20	9 58 53.01	53.50	12 20 19.8	17.1	9.263	49.67	3 9.68	15 51.20	1 5.08	9 55 43.30
21	10 2 35.08	35.53	+12 0 22.0	19.5	9.243	−50.15	+ 2 55.20	15 51.40	1 5.01	9 59 39.86
22	10 6 16.68	17.09	11 40 12.6	10.3	9.224	50.62	2 40.24	15 51.61	1 4.95	10 3 36.41
23	10 9 57.81	58.18	11 19 52.3	50.2	9.205	51.07	2 24.82	15 51.82	1 4.88	10 7 32.97
24	10 13 38.48	38.81	10 59 21.4	19.5	9.187	51.51	2 8.95	15 52.03	1 4.82	10 11 29.52
25	10 17 18.73	19.02	10 38 40.1	38.4	9.169	51.94	1 52.65	15 52.25	1 4.76	10 15 26.07
26	10 20 58.57	58.82	+10 17 48.6	47.1	9.152	−52.35	+ 1 35.94	15 52.47	1 4.70	10 19 22.62
27	10 24 38.01	38.22	9 56 47.3	46.0	9.136	52.75	1 18.82	15 52.69	1 4.64	10 23 19.17
28	10 28 17.07	17.23	9 35 36.5	35.5	9.120	53.14	1 1.33	15 52.91	1 4.58	10 27 15.73
29	10 31 55.78	55.89	9 14 16.5	15.7	9.106	53.52	0 43.49	15 53.13	1 4.54	10 31 12.29
30	10 35 34.15	34.22	8 52 47.5	46.9	9.092	53.88	0 25.31	15 53.35	1 4.49	10 35 8.84
31	10 39 12.91	12.23	+ 8 31 10.0	9.7	9.079	−54.23	+ 0 6.82	15 53.57	1 4.44	10 39 5.39
Sept. 1	10 42 49.96	49.93	8 9 24.2	24.4	9.067	54.57	− 0 11.97	15 53.80	1 4.40	10 43 1.94
2	10 46 27.44	27.36	7 47 30.5	31.0	9.056	54.90	0 31.04	15 54.03	1 4.36	10 46 58.50
3	10 50 4.66	4.53	7 25 29.1	29.9	9.045	55.21	0 50.37	15 54.26	1 4.32	10 50 55.05
4	10 53 41.63	41.45	7 3 20.4	21.5	9.035	55.51	1 9.95	15 54.49	1 4.28	10 54 51.60
5	10 57 18.37	18.14	+ 6 41 4.6	6.0	9.026	−55.80	− 1 29.76	15 54.72	1 4.24	10 58 48.15
6	11 0 54.91	54.63	6 18 42.2	43.9	9.018	56.07	1 49.78	15 54.96	1 4.21	11 2 44.71
7	11 4 31.27	30.94	5 56 13.2	15.3	9.011	56.33	2 9.97	15 55.20	1 4.18	11 6 41.26
8	11 8 7.46	7.08	5 33 38.5	40.8	9.005	56.57	2 30.32	15 55.44	1 4.16	11 10 37.81
9	11 11 43.51	43.08	5 10 58.0	60.7	9.000	56.80	2 50.82	15 55.68	1 4.14	11 14 34.36
10	11 15 19.42	18.95	+ 4 48 12.2	15.2	8.995	−57.01	− 3 11.45	15 55.93	1 4.12	11 18 30.92
11	11 18 55.23	54.70	4 25 21.4	24.8	8.990	57.21	3 32.20	15 56.18	1 4.10	11 22 27.47
12	11 22 30.92	30.34	4 2 26.0	29.7	8.986	57.40	3 53.05	15 56.43	1 4.08	11 26 24.02
13	11 26 6.51	5.88	3 39 26.3	30.4	8.982	57.57	4 13.99	15 56.69	1 4.07	11 30 20.57
14	11 29 42.04	41.36	3 16 22.7	27.1	8.980	57.73	4 35.01	15 56.95	1 4.06	11 34 17.12
15	11 33 17.51	16.78	+ 2 53 15.4	20.2	8.978	−57.87	− 4 56.08	15 57.22	1 4.06	11 38 13.67
16	11 36 52.95	52.16	2 30 5.0	10.1	8.977	58.00	5 17.19	15 57.48	1 4.06	11 42 10.23
17	11 40 28.36	27.52	2 6 51.6	57.1	8.976	58.11	5 38.33	15 57.75	1 4.05	11 46 6.78
18	11 44 3.77	2.88	1 43 35.8	41.6	8.976	58.21	5 59.48	15 58.02	1 4.05	11 50 3.33
19	11 47 39.19	38.25	1 20 17.7	23.9	8.977	58.29	6 20.61	15 58.29	1 4.06	11 53 59.88
20	11 51 14.65	13.66	+ 0 56 57.8	64.3	8.979	−58.36	− 6 41.70	15 58.56	1 4.07	11 57 56.44
21	11 54 50.16	49.12	0 33 36.4	43.3	8.981	58.42	7 2.73	15 58.84	1 4.08	12 1 52.99
22	11 58 25.75	24.65	+ 0 10 13.7	20.9	8.985	58.46	7 23.69	15 59.11	1 4.10	12 5 49.54
23	12 2 1.43	0.27	− 0 13 9.8	2.2	8.989	58.49	7 44.55	15 59.39	1 4.12	12 9 46.09
24	12 5 37.24	36.02	0 36 33.9	26.0	8.995	58.51	8 5.30	15 59.66	1 4.14	12 13 42.65
25	12 9 13.18	11.91	− 0 59 58.2	49.9	9.001	−58.51	− 8 25.91	15 59.94	1 4.17	12 17 39.21
26	12 12 49.29	47.97	1 23 22.4	13.8	9.009	58.50	8 46.35	16 0.21	1 4.20	12 21 35.76
27	12 16 25.59	24.22	1 46 46.1	37.1	9.017	58.47	9 6.58	16 0.49	1 4.23	12 25 32.30
28	12 20 2.10	0.68	2 9 69.1	59.8	9.027	58.43	9 26.61	16 0.76	1 4.26	12 29 28.84
29	12 23 38.86	37.39	2 33 31.0	21.4	9.037	58.38	9 46.41	16 1.03	1 4.30	12 33 25.40
30	12 27 15.88	14.36	− 2 56 51.5	41.6	9.049	−58.31	−10 5.95	16 1.30	1 4.34	12 37 21.96
31	12 30 53.19	51.62	− 3 20 10.2	0.0	9.061	−58.24	−10 25.19	16 1.58	1 4.39	12 41 18.51

Note.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 30 53.19	51.62	– 3 20 10.2	0.0	9.061	–58.94	–10 25.19	16 1.58	1 4.39	12 41 18.51
2	12 34 30.81	29.19	3 43 26.8	16.4	9.074	58.14	10 44.11	16 1.85	1 4.43	12 45 15.06
3	12 38 8.76	7.09	4 6 40.9	30.3	9.068	58.03	11 2.71	16 2.12	1 4.48	12 49 11.61
4	12 41 47.06	45.34	4 29 52.2	41.4	9.104	57.90	11 20.96	16 2.39	1 4.53	12 53 8.17
5	12 45 25.75	23.98	4 52 60.3	49.2	9.120	57.76	11 38.83	16 2.66	1 4.58	12 57 4.72
6	12 49 4.83	3.01	– 5 15 64.9	53.5	9.137	–57.60	–11 56.30	16 2.93	1 4.63	13 1 1.28
7	12 52 44.33	42.46	5 38 65.5	53.8	9.155	57.43	12 13.35	16 3.20	1 4.69	13 4 57.82
8	12 56 24.26	22.34	6 1 61.8	49.9	9.173	57.24	12 29.97	16 3.47	1 4.75	13 8 54.38
9	13 0 4.63	2.67	6 24 53.5	41.4	9.192	57.05	12 46.16	16 3.75	1 4.82	13 12 50.93
10	13 3 45.47	43.46	6 47 40.0	27.7	9.212	56.83	13 1.88	16 4.02	1 4.88	13 16 47.49
11	13 7 26.79	24.74	– 7 10 21.2	8.7	9.232	–56.59	–13 17.10	16 4.30	1 4.95	13 20 44.03
12	13 11 8.61	6.52	7 32 56.4	43.7	9.253	56 34	13 31.83	16 4.57	1 5.03	13 24 40.59
13	13 14 50.95	48.82	7 55 25.5	12.7	9.275	56.07	13 46.05	16 4.85	1 5.11	13 28 37.14
14	13 18 33.81	31.64	8 17 47.8	34.8	9.297	55.78	13 59.75	16 5.12	1 5.19	13 32 33.70
15	13 22 17.21	15.00	8 39 63.1	50.0	9.320	55.48	14 12.91	16 5.40	1 5.27	13 36 30.25
16	13 25 61.16	58.91	– 9 1 70.9	57.7	9.343	–55.16	–14 25.51	16 5.67	1 5.35	13 40 26.80
17	13 29 45.68	43.39	9 23 71.0	57.7	9.367	54.83	14 37.55	16 5.95	1 5.44	13 44 23.35
18	13 33 30.79	28.46	9 45 62.8	49.4	9.392	54.48	14 49.00	16 6.23	1 5.53	13 48 19.91
19	13 37 16.49	14.13	10 7 46.0	32.5	9.417	54.11	14 59.86	16 6.51	1 5.62	13 52 16.46
20	13 41 2.81	0.42	10 29 20.2	6.6	9.443	53.73	15 10.09	16 6.79	1 5.71	13 56 13.01
21	13 44 49.77	47.35	–10 50 45.0	31.4	9.470	–53.33	–15 19.69	16 7.06	1 5.81	14 0 9.56
22	13 48 37.37	34.92	11 11 60.1	46.5	9.497	52.91	15 28.65	16 7.33	1 5.91	14 4 6.11
23	13 52 25.64	23.16	11 32 64.9	51.3	9.525	52.48	15 36.95	16 7.61	1 6.01	14 8 2.67
24	13 56 14.59	12.08	11 53 59.3	45.6	9.554	52.03	15 44.56	16 7.88	1 6.11	14 11 59.23
25	14 0 4.21	1.70	12 14 42.6	29.0	9.584	51.57	15 51.48	16 8.14	1 6.22	14 15 55.79
26	14 3 54.60	52.04	–12 35 14.7	1.1	9.614	–51.09	–15 57.67	16 8.40	1 6.32	14 19 52.33
27	14 7 45.71	43.12	12 55 35.2	21.6	9.645	50.60	16 3.12	16 8.66	1 6.43	14 23 48.89
28	14 11 37.56	34.96	13 15 43.5	30.0	9.677	50.09	16 7.82	16 8.91	1 6.54	14 27 45.44
29	14 15 30.19	27.57	13 35 39.4	26.0	9.709	49.56	16 11.76	16 9.16	1 6.65	14 31 41.99
30	14 19 23.60	20.96	13 55 22.4	9.1	9.742	49.01	16 14.92	16 9.41	1 6.76	14 35 38.55
31	14 23 17.80	15.15	–14 14 52.1	38.9	9.775	–48.45	–16 17.29	16 9.66	1 6.87	14 39 35.11
Nov. 1	14 27 12.81	10.15	14 33 68.2	55.1	9.809	47.87	16 18.84	16 9.90	1 6.98	14 43 31.66
2	14 31 8.65	5.98	14 52 70.2	57.3	9.844	47.28	16 19.56	16 10.14	1 7.10	14 47 28.21
3	14 35 5.32	2.64	15 11 57.8	45.0	9.879	46.67	16 19.46	16 10.38	1 7.21	14 51 24.76
4	14 39 2.82	0.13	15 30 30.4	17.8	9.914	46.04	16 18.52	16 10.62	1 7.33	14 55 21.32
5	14 42 61.16	58.46	– 15 48 47.8	35.4	9.949	–45.39	–16 16.74	16 10.86	1 7.45	14 59 17.88
6	14 46 60.36	57.66	16 6 49.3	37.1	9.984	44.73	16 14.10	16 11.09	1 7.57	15 3 14.43
7	14 50 60.41	57.71	16 24 34.8	22.8	10.019	44.05	16 10.61	16 11.32	1 7.69	15 7 10.98
8	14 54 61.32	58.62	16 41 63.7	52.0	10.055	43.35	16 6.27	16 11.55	1 7.81	15 11 7.53
9	14 59 3.08	0.38	16 59 15.7	4.3	10.090	42.63	16 1.08	16 11.78	1 7.93	15 15 4.09
10	15 3 5.69	3.00	–17 15 70.2	59.1	10.126	–41.90	–15 55.04	16 12.00	1 8.05	15 19 0.64
11	15 7 9.15	6.47	17 32 47.0	36.2	10.162	41.15	15 48.14	16 12.23	1 8.17	15 22 57.20
12	15 11 13.46	10.79	17 48 65.6	55.1	10.197	40.39	15 40.39	16 12.45	1 8.29	15 26 53.76
13	15 15 18.61	15.96	18 4 65.6	55.4	10.232	39.60	15 31.80	16 12.67	1 8.41	15 30 50.32
14	15 19 24.59	21.96	18 20 46.5	36.6	10.266	38.80	15 22.39	16 12.89	1 8.53	15 34 46.87
15	15 23 31.40	28.79	–18 35 68.1	58.5	10.301	–37.98	–15 12.14	16 13.10	1 8.65	15 38 43.43
16	15 27 39.04	36.45	–18 51 9.7	0.4	10.335	–37.15	–15 1.06	16 13.31	1 8.77	15 42 39.98

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 27 39.04	36.45	–18 51 9.7	0.4	10.335	–37.15	–15 1.06	16 13.31	1 8.77	15 42 39.98
17	15 31 47.49	44.92	19 5 51.2	42.2	10.369	36.30	14 49.17	16 13.52	1 8.88	15 46 36.54
18	15 35 56.76	54.22	19 20 12.2	3.6	10.403	35.44	14 36.47	16 13.72	1 8.99	15 50 33.09
19	15 40 6.84	4.34	19 34 12.3	4.0	10.436	34.56	14 22.95	16 13.93	1 9.11	15 54 29.65
20	15 44 17.71	15.24	19 47 51.0	43.1	10.469	33.66	14 8.64	16 14.13	1 9.23	15 58 26.20
21	15 48 29.37	26.94	–20 1 8.1	0.5	10.502	–32.75	–13 53.54	16 14.33	1 9.34	16 2 22.76
22	15 52 41.81	39.42	20 13 63.2	56.0	10.534	31.82	13 37.66	16 14.52	1 9.45	16 6 19.31
23	15 56 55.03	52.68	20 26 36.0	29.1	10.566	30.87	13 21.00	16 14.71	1 9.56	16 10 15.87
24	16 1 9.01	6.70	20 38 45.9	39.4	10.598	29.92	13 3.57	16 14.89	1 9.66	16 14 12.42
25	16 5 23.75	21.49	20 50 32.9	26.7	10.630	28.95	12 45.39	16 15.07	1 9.76	16 18 8.98
26	16 9 39.24	37.03	–21 1 56.4	50.6	10.661	–27.98	–12 26.46	16 15.24	1 9.86	16 22 5.53
27	16 13 55.46	53.30	21 12 56.3	50.8	10.691	26.99	12 6.79	16 15.40	1 9.96	16 26 2.09
28	16 18 12.41	10.30	21 23 32.2	27.1	10.721	25.99	11 46.41	16 15.56	1 10.06	16 29 58.65
29	16 22 30.06	28.01	21 33 43.8	39.0	10.750	24.97	11 25.32	16 15.71	1 10.16	16 33 55.21
30	16 26 48.40	46.41	21 43 30.8	26.4	10.778	23.94	11 3.53	16 15.86	1 10.25	16 37 51.76
Dec. 1	16 31 7.41	5.48	–21 52 52.9	48.8	10.806	–22.90	–10 41.08	16 16.01	1 10.34	16 41 48.32
2	16 35 27.09	25.22	22 1 49.7	46.0	10.833	21.84	10 17.96	16 16.15	1 10.42	16 45 44.88
3	16 39 47.39	45.59	22 10 21.1	17.7	10.859	20.77	9 54.21	16 16.29	1 10.50	16 49 41.44
4	16 44 8.31	6.58	22 18 26.8	23.7	10.884	19.69	9 29.85	16 16.42	1 10.58	16 53 37.99
5	16 48 29.81	28.15	22 26 6.5	3.7	10.907	18.61	9 4.90	16 16.55	1 10.66	16 57 34.55
6	16 52 51.87	50.29	–22 33 19.9	17.4	10.930	–17.51	– 8 39.38	16 16.68	1 10.72	17 1 31.10
7	16 57 14.46	12.95	22 40 6.9	4.7	10.951	16.40	8 13.35	16 16.80	1 10.79	17 5 27.66
8	17 1 37.53	36.11	22 46 27.2	25.3	10.971	15.28	7 46.83	16 16.92	1 10.85	17 9 24.22
9	17 5 61.08	59.74	22 52 20.6	18.9	10.989	14.15	7 19.83	16 17.03	1 10.91	17 13 20.78
10	17 10 25.05	23.79	22 57 47.0	45.5	11.007	13.02	6 52.41	16 17.14	1 10.97	17 17 17.33
11	17 14 49.42	48.24	–23 2 46.1	44.8	11.022	–11.88	– 6 24.60	16 17.25	1 11.02	17 21 13.89
12	17 19 14.15	13.06	23 7 17.7	16.6	11.037	10.73	5 56.41	16 17.35	1 11.07	17 25 10.44
13	17 23 39.21	38.20	23 11 21.8	20.9	11.049	9.58	5 27.91	16 17.45	1 11.11	17 29 7.00
14	17 28 4.55	3.63	23 14 58.1	57.4	11.061	8.42	4 59.11	16 17.55	1 11.15	17 33 3.56
15	17 32 30.15	29.32	23 18 6.7	6.1	11.071	7.26	4 30.06	16 17.64	1 11.19	17 37 0.12
16	17 36 55.97	55.23	–23 20 47.3	46.9	11.080	– 6.10	– 4 0.78	16 17.73	1 11.22	17 40 56.67
17	17 41 21.98	21.33	23 22 59.9	59.6	11.087	4.93	3 31.32	16 17.82	1 11.24	17 44 53.23
18	17 45 48.14	47.58	23 24 44.4	44.2	11.093	3.76	3 1.71	16 17.89	1 11.26	17 48 49.79
19	17 50 14.42	13.95	23 26 0.7	0.6	11.097	2.59	2 31.98	16 17.96	1 11.28	17 52 46.35
20	17 54 40.80	40.42	23 26 48.8	48.7	11.100	1.42	2 2.15	16 18.03	1 11.29	17 56 42.91
21	17 59 7.22	6.93	–23 27 8.6	8.6	11.101	– 0.24	– 1 32.28	16 18.09	1 11.30	18 0 39.47
22	18 3 33.66	33.47	23 27 0.2	0.2	11.102	+ 0.94	1 2.38	16 18.15	1 11.30	18 4 36.02
23	18 7 60.09	59.99	23 26 23.5	23.5	11.100	2.12	0 32.49	16 18.20	1 11.30	18 8 32.58
24	18 12 26.48	26.47	23 25 18.5	18.5	11.098	3.30	– 0 2.66	16 18.25	1 11.29	18 12 29.14
25	18 16 52.80	52.88	23 23 45.3	45.2	11.094	4.48	+ 0 27.11	16 18.29	1 11.28	18 16 25.70
26	18 21 19.03	19.20	–23 21 43.8	43.7	11.090	+ 5.65	+ 0 56.78	16 18.32	1 11.27	18 20 22.25
27	18 25 45.12	45.38	23 19 14.2	14.0	11.084	6.82	1 26.33	16 18.34	1 11.24	18 24 18.81
28	18 30 11.06	11.41	23 16 16.5	16.2	11.078	7.99	1 55.73	16 18.36	1 11.21	18 28 15.37
29	18 34 36.83	37.27	23 12 50.8	50.4	11.069	9.15	2 24.95	16 18.37	1 11.18	18 32 11.93
30	18 39 2.38	2.91	23 8 57.1	56.6	11.059	10.31	2 53.96	16 18.38	1 11.15	18 36 8.48
31	18 43 27.67	28.29	–23 4 35.6	35.0	11.048	+11.47	+ 3 22.71	16 18.38	1 11.11	18 40 5.04
32	18 47 52.69	53.40	–22 59 46.4	45.6	11.036	+12.62	+ 3 51.18	16 18.38	1 11.07	18 44 1.59

Note.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 0	9 18.26	2.179	4 0 50.07	140.98	+21 13 44.6	+225.0	68.31	15 19.2	56 6.8	I. S.
1	10 10.52	2.170	4 57 10.73	140.39	22 3 40.2	+ 39.0	68.10	15 11.3	55 37.3	I. S.
2	11 2.10	2.123	5 52 50.51	137.57	21 42 8.2	-137.9	67.34	15 4.0	55 10.8	I. N. S.
3	11 52.17	2.046	6 46 59.43	132.93	20 13 51.6	-297.4	66.13	14 57.6	54 47.6	I. S
4	12 40.17	1.953	7 39 3.51	127.33	17 47 36.2	-429.2	64.68	14 52.3	54 28.0	II. S.
5	13 25.91	1.861	8 28 52.26	121.89	+14 34 21.4	-532.2	63.25	14 48.2	54 13.1	II. S.
6	14 9.61	1.784	9 16 37.77	117.19	10 45 36.7	-605 5	62.05	14 45.7	54 3.7	II. S.
7	14 51.74	1.732	10 2 49.57	114.07	6 32 12.8	-655.9	61.26	14 45.0	54 1.3	II. S.
8	15 33.01	1.712	10 48 8.78	112.89	+ 2 3 59.4	-681.5	60.99	14 46.6	54 7.1	II. S.
9	16 14.22	1.727	11 33 24.05	113.79	- 2 30 3.1	-685.1	61.31	14 50.7	54 22.0	II. S.
10	16 56.23	1.780	12 19 28.82	117.00	- 7 1 3.4	-666.1	62.24	14 57.5	54 47.1	II. S.
11	17 40.01	1.873	13 7 19.49	122.60	-11 19 26.1	-620.2	63.78	15 7.2	55 22.8	II. S.
12	18 26.48	2.004	13 57 51.64	130.41	-15 13 44.8	-544.6	65.84	15 19.6	56 8.3	II. S.
13	19 16.41	2.161	14 51 52.52	139.85	-18 29 50.0	-428.7	68.22	15 34.2	57 2.0	II. S.
14	20 10.25	2.324	15 49 48.09	149.69	-20 50 40.7	-267 7	70.61	15 50.4	58 1.5	II. S.
15	21 7.77	2.461	16 51 25.45	157.98	-21 58 2.9	- 62.5	72.55	16 6.8	59 1.8	II. N. S.
16	22 7.94	2.538	17 55 41.72	162.63	-21 36 35.7	+172.8	73.59	16 21.9	59 57.0	II. N. S.
17	23 9.03	2.538	19 0 53.90	162.61	-19 39 31.7	416.0	73.53	16 33.8	60 40.9	II. N. S.
19	0 9.27	2.472	20 5 14.64	158.59	-16 12 45.2	615.9	72.56	16 41.1	61 7.5	II. S.
20	1 7.43	2.372	21 7 30.58	152.57	-11 34 19.9	765.0	71.13	16 42.8	61 13.7	I. S.
21	2 3.14	2.273	22 7 18.61	146.57	- 6 9 53.2	+845.6	69.70	16 38.9	60 59.4	I. S.
22	2 56.69	2.196	23 4 57.28	141.95	- 0 26 51.0	859.0	68.61	16 30.1	60 27.3	I. S.
23	3 48.78	2.151	0 1 7.73	139.95	+ 5 9 36.7	814.4	67.99	16 18.0	59 42.7	I. S.
24	4 40.17	2.137	0 56 36.39	138.41	10 18 31.4	723.1	67.83	16 3.9	58 51.2	I. S.
25	5 31.52	2.145	1 52 1.97	138.89	14 43 21.6	595.7	67.98	15 49.6	57 58.4	I. S.
26	6 23.18	2.164	2 47 46.74	139.65	+18 11 38.9	+449.0	68.22	15 35.8	57 8.0	I. S.
27	7 15.17	2.169	3 43 51.24	140.36	20 34 42.3	271.3	68.32	15 23.5	56 22.5	I. S.
28	8 7.13	2.157	4 39 54.22	139.62	21 47 44.1	+ 93.7	68.08	15 12.8	55 43.3	I. S.
29	8 58.47	2.116	5 35 19.36	137.19	21 50 9.0	- 80.1	67.39	15 3.9	55 10.7	I. S.
30	9 48.52	2.050	6 29 27.05	133.23	20 45 31.9	-240.1	66.30	14 56.8	54 44.5	I. S.
31	10 36.77	1.969	7 21 46.77	128.32	+18 40 59.2	-378.6	64.96	14 51.3	54 24.5	I. S.
Feb. 1	11 23.01	1.885	8 12 4.83	123.23	15 46 0.8	-491.7	63.58	14 47.4	54 10.0	I. S.
2	12 7.30	1.810	9 0 26.11	118.70	12 11 13.6	-577.7	62.34	14 44.8	54 0.8	I. II. S.
3	12 49.99	1.753	9 47 11.31	115.29	8 7 24.5	-637.1	61.42	14 43.8	53 56.8	II. S.
4	13 31.62	1.721	10 32 52.54	113.42	+ 3 44 53.8	-671.4	60.94	14 44.3	53 58.6	II. S.
5	14 12.85	1.719	11 18 9.55	113.31	- 0 46 28.4	-681.6	60.93	14 46.5	54 6.6	II. S.
6	14 54.42	1.750	12 3 47.01	115.15	- 5 17 12.9	-668.1	61.53	14 50.6	54 21.7	II. S.
7	15 37.11	1.814	12 50 32.48	118.98	- 9 37 39.9	-628.8	62.65	14 56.9	54 44.8	II. S.
8	16 21.74	1.911	13 39 14.03	124.79	-13 37 22.5	-563.9	64.26	15 5.4	55 16.3	II. S.
9	17 9.03	2.035	14 30 35.87	132.27	-17 4 26.3	-465.9	66.26	15 16.4	55 56.7	II. S.
10	17 59.53	2.175	15 25 10.69	140.72	-19 45 7.6	-331.1	68.43	15 29.7	56 45.5	II. S.
11	18 53.41	2.312	16 23 8.58	148.96	-21 24 17.6	-158.2	70.46	15 44.9	57 41.4	II. S.
12	19 50.26	2.418	17 24 5.84	155.39	-21 47 13.7	+ 48.3	71.98	16 1.2	58 41.0	II. S.
13	20 49.10	2.473	18 27 2.43	158.73	-20 43 7.4	273.6	72.71	16 17.1	59 39.6	II. N. S.
14	21 48.56	2.471	19 30 36.24	158.53	-18 9 9.3	+493.0	72.59	16 31.1	60 31.1	II. N. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 14	21 48.56	2.471	19 30 36.24	158.53	−18 9 9.3	+493.0	72.59	16 31.1	60 31.1	II. N. S.
15	22 47.36	2.423	20 33 30.42	155.65	−14 13 11.0	679.2	71.85	16 41.4	61 8.8	II. N. S.
16	23 44.72	2.356	21 34 58.10	151.60	− 9 13 20.6	809.3	70.83	16 46.4	61 27.2	II. S.
18	0 40.49	2.294	22 34 49.73	147.85	− 3 34 48.6	871.4	69.90	16 45.4	61 23.6	I. S.
19	1 34.98	2.251	23 33 24.43	145.29	+ 2 14 33.7	864.2	69.31	16 38.6	60 58.6	I. S.
20	2 28.72	2.231	0 31 14.21	144.10	+ 7 48 11.9	+794.4	69.08	16 27.0	60 15.8	I. S.
21	3 22.21	2.229	1 28 49.09	143.95	12 43 28.8	674.7	69.10	16 12.2	59 21.4	I. S.
22	4 15.73	2.232	2 26 26.07	144.12	16 43 9.5	518.9	69.20	15 55.9	58 21.8	I. S.
23	5 9.26	2.226	3 24 2.82	143.78	19 35 48.4	341.9	69.16	15 39.8	57 22.5	I. S.
24	6 2.42	2.200	4 21 17.66	142.21	21 15 43.8	+157.5	68.79	15 25.0	56 28.3	I. S.
25	6 54.65	2.148	5 17 36.46	139.10	+21 42 31.9	− 21.8	67.99	15 12.2	55 41.3	I. S.
26	7 45.35	2.074	6 12 23.90	134.67	21 0 15.9	−186.5	66.81	15 1.9	55 3.2	I. N. S.
27	8 34.12	1.988	7 5 14.59	129.49	19 16 13.0	−330.0	65.41	14 54.0	54 34.3	I. N.
28	9 20.80	1.902	7 55 59.28	124.29	16 39 34.6	−448.9	63.97	14 48.5	51 14.2	I. N.
Mar. 1	10 5.50	1.826	8 44 45.42	119.72	13 20 19.1	−543.0	62.67	14 45.2	54 2.0	I. N.
2	10 48.59	1.768	9 31 54.27	116.25	+ 9 28 31.1	−611.8	61.67	14 43.9	53 57.1	I. N.
3	11 30.57	1.734	10 17 56.50	114.21	5 14 4.2	−656.3	61.07	14 44.2	53 58.3	I. N. S.
4	12 12.05	1.727	11 3 28.97	113.79	+ 0 46 43.2	−676.4	60.94	14 46.1	54 5.1	I. II. S.
5	12 53.71	1.749	11 49 11.91	115.09	− 3 43 45.5	−671.7	61.31	14 49.3	54 17.1	II. S.
6	13 36.24	1.800	12 35 47.03	118.10	− 8 7 14.0	−641.1	62.18	14 54.0	54 34.4	II. S.
7	14 20.31	1.878	13 23 55.20	122.80	−12 12 54.7	−582.5	63.50	15 0.2	54 57.1	II. S.
8	15 6.54	1.978	14 14 13.23	128.68	−15 49 5.7	−493.0	65.16	15 7.9	55 25.5	II. S.
9	15 55.38	2.093	15 7 8.12	135.77	−18 43 5.0	−371.2	67.00	15 17.3	56 0.0	II. S.
10	16 46.99	2.207	16 2 49.84	142.61	−20 41 38.9	−216.2	68.78	15 28.5	56 40.8	II. S.
11	17 41.14	2.301	17 1 4.18	148.29	−21 32 12.4	− 32.3	70.22	15 41.1	57 27.0	II. S.
12	18 37.16	2.360	18 1 11.16	151.87	−21 4 54.6	+170.6	71.09	15 54.8	58 17.5	II. N. S.
13	19 34.11	2.378	19 2 13.66	152.93	−19 15 7.1	377.0	71.31	16 8.8	59 8.9	II. N.
14	20 31.02	2.360	20 3 14.60	151.87	−16 5 23.0	567.2	71.00	16 21.9	59 57.2	II. N.
15	21 27.26	2.325	21 3 34.71	149.72	−11 46 9.3	722.2	70.41	16 32.7	60 36.7	II. N.
16	22 22.61	2.290	22 3 1.53	147.61	− 6 35 2.7	894.1	69.83	16 39.6	61 2.0	II. N.
17	23 17.28	2.269	23 1 47.03	146.37	− 0 55 9.4	+864.5	69.48	16 41.4	61 8.8	II. N. S.
19	0 11.69	2.269	0 0 17.36	146.36	+ 4 47 42.6	838.8	69.46	16 37.8	60 55.4	I. S.
20	1 6.31	2.284	0 58 59.61	147.28	10 7 36.5	750.8	69.72	16 29.0	60 23.3	I. S.
21	2 1.37	2.303	1 58 8.80	148.44	14 41 27.5	610.9	70.05	16 16.2	59 36.0	I. S.
22	2 56.77	2.310	2 57 38.61	148.83	18 11 30.6	434.9	70.20	16 0.7	58 39.3	I. S.
23	3 52.02	2.288	3 56 59.06	147.55	+20 27 2.6	+241.5	69.96	15 44.5	57 39.9	I. S.
24	4 46.34	2.233	4 55 24.02	144.20	21 24 49.9	+ 48.8	69.18	15 28.9	56 42.6	I. S.
25	5 38.95	2.147	5 52 5.99	139.09	21 8 14.3	−128.5	67.93	15 15.1	55 51.8	I. N. S.
26	6 29.29	2.046	6 46 31.02	132.94	19 45 14.3	−282.1	66.37	15 3.6	55 9.7	I. N.
27	7 17.14	1.944	7 38 26.70	126.79	17 26 6.6	−408.9	64.74	14 54.9	54 37.6	I. N.
28	8 2.67	1.853	8 28 2.00	121.35	+14 21 38.2	−509.2	63.24	14 49.0	54 16.1	I. N.
29	8 46.27	1.785	9 15 42.05	117.23	10 42 6.1	−584.5	62.06	14 45.9	54 4.6	I. N.
30	9 28.55	1.743	10 2 2.22	114.73	6 37 4.8	−636.7	61.31	14 45.3	54 2.2	I. N.
31	10 10.18	1.731	10 47 43.22	113.99	+ 2 15 43.4	−666.2	61.04	14 46.8	54 7.8	I. N.
32	10 51.87	1.749	11 33 28.26	115.06	− 2 12 46.5	−672.2	61.28	14 50.1	54 20.1	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
April 1	10 51.87	1.749	11 33 28.26	115.06	− 2 12 46.5	−672.2	61.28	14 50.1	54 20.1	I. N.
2	11 34.35	1.796	12 20 0.67	117.89	− 6 38 37.3	−652.5	62.03	14 54.9	54 37.7	I. N. S.
3	12 18.30	1.871	13 8 1.58	122.41	−10 50 59.6	−604.3	63.23	15 0.9	54 59.6	II. S.
4	13 4.32	1.967	13 58 6.42	128.19	−14 37 48.1	−524.2	64.77	15 7.8	55 24.9	II. S.
5	13 52.79	2.074	14 50 39.45	134.62	−17 45 51.2	−410.3	66.49	15 15.5	55 53.4	II. S.
6	14 43.83	2.177	15 45 46.83	140.86	−20 1 34.5	−264.9	68.13	15 24.1	56 24.6	II. S.
7	15 37.14	2.260	16 43 10.91	145.84	−21 12 31.1	− 87.7	69.42	15 33.2	56 58.2	II. S.
8	16 32.04	2.307	17 42 9.97	148.68	−21 9 20.3	+105.3	70.19	15 43.0	57 34.2	II. N. S.
9	17 27.57	2.314	18 41 47.91	149.13	−19 47 51.3	301.1	70.34	15 53.3	58 11.4	II. N.
10	18 22.88	2.290	19 41 11.66	147.64	−17 10 10.1	483.8	69.97	16 3.3	58 48.9	II. N.
11	19 17.38	2.251	20 39 47.38	145.30	−13 24 35.2	+638.4	69.37	16 12.9	59 24.2	II. N.
12	20 10.97	2.217	21 37 28.40	143.25	− 8 44 38.8	753.8	68.81	16 21.2	59 54.4	II. N.
13	21 3.95	2.202	22 34 32.43	142.33	− 3 28 0.3	820.7	68.52	16 26.9	60 15.9	II. N.
14	21 56.87	2.212	23 31 32.56	142.95	+ 2 4 32.1	832.5	68.61	16 29.3	60 24.6	II. N.
15	22 50.33	2.247	0 29 5.56	145.01	7 30 3.4	785.3	69.07	16 27.4	60 18.0	II. N.
16	23 44.79	2.293	1 27 38.89	147.83	+12 25 8.0	+681.0	69.75	16 21.5	59 56.0	II. N. S.
18	0 40.36	2.334	2 27 18.58	150.31	16 28 10.7	527.2	70.37	16 11.7	59 19.8	I. S.
19	1 36.63	2.348	3 27 40.75	151.15	19 22 20.7	339.7	70.62	15 59.0	58 33.3	I. S.
20	2 32.75	2.319	4 27 53.35	149.42	20 58 7.5	+138.8	70.25	15 44.9	57 41.1	I. S.
21	3 27.61	2.245	5 26 50.85	144.96	21 14 25.6	− 54.7	69.23	15 30.5	56 48.3	I. N. S.
22	4 20.28	2.139	6 23 35.92	138.57	+20 17 26.4	−225.5	67.69	15 17.1	55 59.1	I. N.
23	5 10.20	2.021	7 17 36.06	131.43	18 17 54.4	−366.7	65.91	15 5.6	55 17.0	I. N.
24	5 57.33	1.910	8 8 48.36	124.75	15 28 7.3	−477.2	64.18	14 56.7	54 44.3	I. N.
25	6 42.03	1.820	8 57 34.18	119.33	11 59 52.7	−559.7	62.72	14 50.7	54 22.3	I. N.
26	7 24.91	1.759	9 44 30.45	115.67	8 3 38.9	−617.7	61.69	14 47.7	54 11.2	I. N.
27	8 6.72	1.732	10 30 22.51	114.01	+ 3 48 39.8	−653.7	61.18	14 47.6	54 10.7	I. N.
28	8 48.27	1.738	11 15 59.14	114.40	− 0 36 26.3	−668.2	61.22	14 50.0	54 19.6	I. N.
29	9 30.38	1.778	12 2 9.90	116.84	− 5 2 49.3	−659.8	61.83	14 54.8	54 37.2	I. N.
30	10 13.88	1.851	12 49 42.68	121.20	− 9 20 38.1	−624.7	62.95	15 1.4	55 1.4	I. N.
May 1	10 59.44	1.950	13 39 20.24	127.16	−13 18 22.4	−558.5	64.49	15 9.2	55 30.2	I. N.
2	11 47.60	2.065	14 31 34.36	134.11	−16 42 41.9	−456.9	66.27	15 17.8	56 1.9	I. II. N. S.
3	12 38.57	2.181	15 26 37.51	141.05	−19 18 58.7	−318 3	68.03	15 26.7	56 34.3	II. S.
4	13 32.09	2.274	16 24 14.30	146.66	−20 52 57.6	−146.8	69.46	15 35.4	57 6.4	II. S.
5	14 27.41	2.327	17 23 38.86	149.87	−21 13 22.6	+ 46.8	70.30	15 43.7	57 36.9	II. N. S.
6	15 23.40	2.330	18 23 44.25	150.11	−20 14 41.3	245.8	70.42	15 51.4	58 5.0	II. N.
7	16 18.96	2.293	19 23 23.23	147.82	−17 58 38.8	+430.7	69.92	15 58.3	58 30.3	II. N.
8	17 13.31	2.234	20 21 49.65	144.23	−14 33 52.5	587.2	69.08	16 4.3	58 52.5	II. N.
9	18 6.22	2.177	21 18 49.68	140.84	−10 13 58.0	705.3	68.24	16 9.4	59 11.2	II. N.
10	18 57.97	2.140	22 14 39.98	138.61	− 5 15 29.4	779.4	67.67	16 13.3	59 25.5	II. N.
11	19 49.19	2.134	23 9 57.98	138.22	+ 0 3 21.0	806.6	67.52	16 15.4	59 33.3	II. N.
12	20 40.64	2.159	0 5 29.95	139.76	+ 5 23 13.7	+784.2	67.85	16 15.5	59 33.7	II. N.
13	21 33.04	2.211	1 1 59.02	142.87	10 24 0.9	711.2	68.58	16 13.1	59 25.0	II. N.
14	22 26.84	2.273	1 59 52.68	146.61	14 45 32.3	588.7	69.46	16 8.0	59 6.2	II. N.
15	23 22.06	2.324	2 59 10.96	149.67	18 9 19.0	424.3	70.17	16 0.3	58 37.8	II. N. s.
17	0 18.10	2.339	3 59 19.67	150.60	+20 21 14.5	+232.4	70.40	15 50.3	58 1.2	I. N. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 17	0 18.10	2.339	3 59 19.67	150.60	+20 21 14.5	+232.4	70.40	15 50.3	58 1.2	I. N. S.
18	1 13.94	2.304	4 59 15.48	148.51	21 14 14.1	+ 33.7	69.92	15 38.9	57 19.1	I. N. S.
19	2 8.34	2.222	5 57 45.28	143.53	20 49 27.6	−153.5	68.75	15 26.9	56 35.2	I. N.
20	3 0.35	2.108	6 53 50.60	136.70	19 15 6.3	−313.1	67.09	15 15.5	55 52.8	I. N.
21	3 49.48	1.987	7 47 -3.18	129.38	16 43 24.4	−439.7	65.28	15 5.2	55 15.5	I. N.
22	4 35.81	1.877	8 37 26.69	122.77	+13 27 35.2	−534.2	63.59	14 57.1	54 45.6	I. N.
23	5 19.78	1.793	9 25 29.10	117.71	9 39 50.9	−600.1	62.26	14 51.5	54 25.1	I. N.
24	6 2.12	1.742	10 11 53.01	114.59	5 30 41.4	−641.8	61.42	14 48.7	54 15.0	I. N.
25	6 43.66	1.726	10 57 28.54	113.71	+ 1 9 9.4	−662.2	61.16	14 49.1	54 16.3	I. N.
26	7 25.27	1.748	11 43 9.06	115.04	− 3 16 22.1	−661.6	61.49	14 52.4	54 28.3	I. N.
27	8 7.87	1.808	12 29 48.28	118.60	− 7 37 13.0	−638.3	62.41	14 58.3	54 50.0	I. N.
28	8 52.30	1.901	13 18 17.90	124.20	−11 43 25.1	−587.7	63.85	15 6.5	55 20.2	I. N.
29	9 39.30	2.021	14 9 22.52	131.41	−15 22 58.6	−504.2	65.68	15 16.4	55 56.7	I. N.
30	10 29.38	2.153	15 3 31.61	139.38	−18 21 37.5	−382.6	67.66	15 27.3	56 36.5	I. N.
31	11 22.56	2.275	16 0 48.03	146.75	−20 23 46.9	−292.0	69.46	15 38.3	57 17.1	I. N.
June 1	12 18.31	2.361	17 0 38.54	151.95	−21 14 58.4	− 29.7	70.74	15 48.6	57 55.0	II. N. s.
2	13 15.48	2.391	18 1 54.77	153.78	−20 45 29.2	+177.8	71.18	15 57.6	58 27.8	II. N.
3	14 12.67	2.365	19 3 12.21	152.14	−18 53 38.5	378.2	70.84	16 4.5	58 53.4	II. N.
4	15 8.68	2.298	20 3 18.72	148.19	−15 46 40.8	550.4	69.92	16 9.4	59 11.2	II. N.
5	16 2.89	2.220	21 1 36.42	143.36	−11 38 56.6	690.6	68.80	16 12.0	59 20.9	II. N.
6	16 55.30	2.153	21 58 6.16	139.35	− 6 48 36.9	+769.9	67.84	16 12.7	59 23.4	II. N.
7	17 46.42	2.114	22 53 18.59	137.03	− 1 35 3.5	797.0	67.27	16 11.7	59 19.5	II. N.
8	18 37.03	2.111	23 48 0.29	136.80	+ 3 42 36.4	783.8	67.20	16 9.2	59 10.3	II. N.
9	19 27.97	2.139	0 43 1.13	138.56	8 45 51.7	726.0	67.62	16 5.3	58 56.2	II. N.
10	20 19.90	2.192	1 39 2.37	141.70	13 16 49.7	622.8	68.36	16 0.2	58 37.3	II. N.
11	21 13.20	2.250	2 36 25.69	145.19	+16 58 43.3	+480.6	69.17	15 53.8	58 14.0	II. N.
12	22 7.74	2.290	3 35 3.27	147.65	19 37 6.9	307.0	69.71	15 46.2	57 46.2	II. N.
13	23 2.84	2.293	4 34 14.76	147.84	21 2 5.4	+116.2	69.72	15 37.7	57 14.7	- II. N.
14	23 57.44	2.248	5 32 56.46	145.15	21 10 14.8	− 73.9	69.05	15 28.4	56 40.5	I. II. N.
16	0 50.43	2.161	6 30 1.31	139.91	20 5 21.5	−246.4	67.76	15 18.8	56 5.5	I. N.
17	1 41.01	2.061	7 24 40.63	133.94	+17 56 59.9	−389.9	66.11	15 9.7	55 31.8	I. N.
18	2 28.85	1.937	8 16 35.42	126.40	14 57 50.2	−500.3	64.38	15 1.4	55 1.4	I. N.
19	3 14.11	1.839	9 5 55.44	120.48	11 21 1.9	−578.6	62.87	14 54.6	54 36.8	I. N.
20	3 57.32	1.767	9 53 11.51	116.16	7 18 35.7	−629.2	61.76	14 50.1	54 20.0	I. N.
21	4 39.19	1.728	10 39 7.10	113.84	+ 3 0 52.2	−655.6	61.16	14 48.1	54 12.6	I. N.
22	5 20.55	1.725	11 24 32.40	113.66	− 1 23 8.8	−661.0	61.14	14 48.9	54 15.4	I. N.
23	6 2.31	1.760	12 10 20.87	115.76	− 5 45 5.3	−645.2	61.73	14 52.7	54 29.4	I. N.
24	6 45.34	1.832	12 57 26.78	120.10	− 9 56 14.0	−606.4	62.89	14 59.3	54 53.7	I N.
25	7 30.53	1.939	13 46 42.11	126.49	−13 46 30.0	−539.9	64.56	15 8.0	55 28.1	I. N.
26	8 18.60	2.071	14 38 50.87	134.44	−17 3 40.3	−439.9	66.57	15 20.3	56 10.7	I. N.
27	9 9.99	2.211	15 34 19.21	142.91	−19 33 15.5	−301.4	68.65	15 33.3	56 58.6	I. N.
28	10 4.63	2.336	16 33 2.97	150.42	−20 59 38.5	−194.6	70.44	15 46.9	57 48.4	I. N.
29	11 1.78	2.416	17 34 18.20	155.97	−21 9 1.1	+ 81.1	71.56	15 59.8	58 35.9	I. N.
30	12 0.15	2.435	18 36 46.25	156.41	−19 53 32.6	295.6	71.81	16 10.8	59 16.3	I. II. N.
31	12 58.24	2.396	19 38 57.57	154.04	−17 14 46.9	+492.6	71.26	16 18.9	59 46.1	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 1	12 58.24	2.396	19 38 57.57	154.04	−17 14 46.9	+492.6	71.26	16 18.9	59 46.1	II. N.
2	13 54.89	2.322	20 39 42.69	149.52	−13 24 12.9	651.6	70.20	16 23.5	60 3.0	II. N.
3	14 49.61	2.246	21 38 31.37	144.61	− 8 40 34.1	757.3	69.05	16 24.3	60 6.1	II. N.
4	15 42.54	2.175	22 35 32.22	140.72	− 3 25 51.2	807.0	68.14	16 21.8	59 56.9	II. N.
5	16 34.25	2.140	23 31 20.23	138.62	+ 1 57 52.1	803.1	67.65	16 16.6	59 37.5	II. N.
6	17 25.53	2.138	0 26 41.57	138.48	+ 7 10 11.3	+750.9	67.64	16 9.4	59 11.4	II. N.
7	18 17.09	2.163	1 22 20.45	139.98	11 52 52.3	655.9	68.02	16 1.1	58 40.8	II. N.
8	19 9.46	2.203	2 18 47.83	142.36	15 49 57.8	594.0	68.59	15 52.2	58 8.1	II. N.
9	20 2.78	2.239	3 16 12.39	144.54	18 48 7.3	362.6	69.09	15 43.2	57 34.9	II. N.
10	20 56.74	2.252	4 14 15.14	145.37	20 37 35.1	+189.5	69.23	15 34.2	57 1.9	II. N.
11	21 50.60	2.229	5 12 12.46	144.01	+21 13 29.5	− 2.7	68.83	15 25.4	56 29.7	II. N.
12	22 43.45	2.169	6 9 8.58	140.31	20 36 48.1	−178.0	67.86	15 17.0	55 58.8	II. N.
13	23 34.45	2.079	7 4 13.37	134.68	18 54 0.3	−331.6	66.45	15 9.0	55 29.5	II. N.
15	0 23.09	1.974	7 56 56.58	128.70	16 15 35.2	−455.4	64.86	15 1.7	55 2.7	I. N.
16	1 9.30	1.876	8 47 13.08	122.80	12 53 53.8	−547.9	63.33	14 55.4	54 39.6	I. N.
17	1 53.36	1.797	9 35 19.64	117.98	+ 9 1 20.1	−610.2	62.07	14 50.4	54 21.2	I. N.
18	2 35.77	1.744	10 21 48.63	114.73	4 49 16.0	−646.0	61.24	14 47.2	54 9.2	I. N.
19	3 17.26	1.721	11 7 21.73	113.36	+ 0 27 45.7	−657.9	60.92	14 46.0	54 4.8	I. N.
20	3 58.61	1.731	11 52 46.01	114.01	− 3 54 9.1	−648.2	61.14	14 47.2	54 9.3	I. N.
21	4 40.64	1.777	12 38 51.19	116.78	− 8 7 52.1	−616.7	61.96	14 51.2	54 23.9	I. N.
22	5 24.18	1.857	13 26 27.45	121.58	−12 4 23.3	−561.5	63.29	14 58.0	54 49.0	I. N.
23	6 10.02	1.967	14 16 22.03	128.23	−15 33 28.3	−478.8	65.05	15 7.7	55 24.7	I. N.
24	6 58.80	2.099	15 9 13.01	136.15	−18 23 3.5	−363.3	67.07	15 20.1	56 9.8	I. N.
25	7 50.82	2.235	16 5 19.64	144.40	−20 19 17.7	−211.7	69.08	15 34.3	57 2.4	I. N.
26	8 45.92	2.350	17 4 31.22	151.30	−21 7 52.2	− 26.0	70.74	15 49.8	57 59.2	I. N.
27	9 43.32	2.423	18 6 1.05	155.64	−20 36 55.8	+183.2	71.72	16 5.2	58 55.9	I. N.
28	10 41.78	2.438	19 8 34.58	156.58	−18 41 0.1	394.9	71.89	16 18.8	59 46.1	I. N. s.
29	11 39.98	2.405	20 10 52.74	154.52	−15 24 5.2	584.5	71.36	16 29.5	60 25.2	I. N.
30	12 36.97	2.343	21 11 58.41	150.81	−11 0 3.6	727.2	70.46	16 35.8	60 48.3	II. N.
31	13 32.41	2.278	22 11 30.18	146.23	− 5 50 10.6	811.7	69.54	16 37.1	60 53.0	II. N.
Aug. 1	14 26.48	2.231	23 9 39.30	144.06	− 0 19 7.9	+833.4	68.88	16 33.5	60 39.7	II. N.
2	15 19.68	2.208	0 6 56.97	142.68	+ 5 8 29.3	795.7	68.60	16 25.8	60 11.6	II. N.
3	16 12.63	2.209	1 3 59.65	142.73	10 10 34.9	707.8	68.67	16 15.2	59 32.6	II. N.
4	17 5.83	2.226	2 1 16.61	143.75	14 28 44.4	577.8	68.95	16 3.0	58 47.8	II. N.
5	17 59.46	2.243	2 59 0.00	144.80	17 48 43.0	418.1	69.22	15 50.4	58 1.3	II. N.
6	18 53.36	2.245	3 56 59.58	144.94	+20 0 49.6	+240.4	69.24	15 38.1	57 16.2	II. N.
7	19 47.02	2.220	4 54 44.00	143.44	21 0 22.0	+ 57.5	68.82	15 26.8	56 34.7	II. N.
8	20 39.69	2.164	5 51 29.82	140.10	20 47 50.1	−116.7	67.92	15 16.7	55 57.8	II. N.
9	21 30.71	2.083	6 46 35.55	136.19	19 28 31.4	−275.0	66.62	15 8.0	55 25.6	II. N. S.
10	22 19.62	1.990	7 39 33.55	129.58	17 11 19.7	−406.3	65.10	15 0.6	54 58.4	II. N. S.
11	23 6.23	1.898	8 30 15.78	124.02	+14 7 13.3	−509.3	63.61	14 54.5	54 36.0	II. N. s.
12	23 50.77	1.818	9 18 52.94	119.25	10 27 48.4	−583.0	62.31	14 49.7	54 18.6	II. N.
14	0 33.68	1.760	10 5 50.04	115.76	6 24 22.7	−629.6	61.37	14 46.3	54 6.1	I. N.
15	1 15.47	1.798	10 51 41.30	113.81	+ 2 7 27.9	−651.0	60.87	14 44.4	53 59.1	I. N.
16	1 56.84	1.794	11 37 6.46	113.59	− 2 13 12.1	−648.6	60.85	14 44.2	53 58.3	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 16	1 56.84	1.724	11 37 6.46	113.59	− 2 13 12.1	−648.6	60.85	14 44.2	53 58.3	I. N.
17	2 38.47	1.751	12 22 48.01	115.19	− 6 28 26.2	−623.7	61.35	14 46.0	54 4.9	I. N.
18	3 21.10	1.807	13 9 29.40	118.58	−10 29 9.3	−575.8	62.34	14 50.0	54 20.0	I. N.
19	4 5.42	1.891	13 57 52.47	123.63	−14 5 49.5	−503.1	63.75	14 56.6	54 43.9	I. N.
20	4 52.05	1.998	14 48 34.17	130.04	−17 8 0.7	−402.9	65.47	15 5.8	55 17.5	I. N.
21	5 41.40	2.116	15 42 0.13	137.18	−19 24 6.4	−272.4	67.32	15 17.5	56 0.7	I. N.
22	6 33.60	2.231	16 38 17.03	144.09	−20 41 47.8	−111.2	69.05	15 31.7	56 52.7	I. N.
23	7 28.32	2.324	17 37 5.98	149.66	−20 49 27.8	+ 75.7	70.38	15 47.4	57 50.3	I. N.
24	8 24.84	2.378	18 37 42.61	152.96	−19 38 41.4	278.5	71.12	16 3.8	58 50.6	I. n. S.
25	9 22.15	2.391	19 39 7.57	153.73	−17 7 12.1	476.4	71.24	16 19.4	59 48.0	I. S.
26	10 19.35	2.372	20 40 25.60	152.54	−13 21 0.4	+648.3	70.89	16 32.6	60 36.3	I. n. S.
27	11 15.86	2.337	21 41 2.08	150.46	− 8 34 45.3	773.8	70.34	16 41.5	61 9.3	I. N. s.
28	12 11.56	2.307	22 40 49.50	148.00	− 3 10 6.6	838.6	69.88	16 45.1	61 22.5	II. N.
29	13 6.68	2.290	23 40 2.22	147.64	+ 2 27 15.2	837.1	69.67	16 43.0	61 14.6	II. N.
30	14 1.62	2.292	0 39 4.42	147.70	7 51 2.4	771.8	69.73	16 35.4	60 46.7	II. N.
31	14 56.74	2.303	1 38 16.87	148.39	+12 37 26.5	+652.2	69.97	16 23.6	60 3.3	II. N.
Sept. 1	15 52.12	2.311	2 37 45.68	148.92	16 27 28.3	492.5	70.16	16 9.1	59 10.3	II. N.
2	16 47.54	2.302	3 37 16.42	148.40	19 8 21.6	309.3	70.07	15 53.6	58 13.3	II. N.
3	17 42.43	2.266	4 36 15 43	146 90	20 34 7.5	+119.5	69.54	15 38.5	57 17.8	II. N.
4	18 36.08	2.200	5 33 59.55	142.19	20 45 10.3	− 61.9	68.54	15 24.8	56 27.5	II. N.
5	19 27.83	2.110	6 29 49.35	136.79	+19 47 7.2	−234.4	67.14	15 13.0	55 44.2	II. n. S.
6	20 17.27	2.010	7 23 20.84	130.79	17 49 2.8	−361.3	65.54	15 3.2	55 8.1	II. S.
7	21 4.34	1.914	8 14 29.43	125.02	15 1 42.2	−470.6	63.96	14 55.6	54 40.0	II. S.
8	21 49.26	1.833	9 3 28.40	120.10	11 36 11.6	−552.5	62.58	14 49.9	54 19.3	II. S.
9	22 32.46	1.772	9 50 43.81	116.44	7 43 15.5	−607.9	61.54	14 46.1	54 5.3	II. S.
10	23 14.50	1.736	10 36 49.33	114.29	+ 3 33 4.6	−639.0	60.92	14 44.0	53 57.5	II. N. s.
11	23 55.98	1.727	11 22 22.53	113.75	− 0 44 40.1	−646.0	60.76	14 43.4	53 55.5	I. II. N.
13	0 37.60	1.746	12 8 2.52	114.84	− 5 0 31.8	−629.6	61.07	14 44.4	53 58.9	I. N.
14	1 19.96	1.790	12 54 27.83	117.58	− 9 5 1.3	−588.9	61.83	14 46.9	54 8.2	I. N.
15	2 3.68	1.857	13 42 14.51	121.60	−12 48 21.6	−523.5	62.99	14 51.2	54 24.0	I. N.
16	2 49.24	1.943	14 31 53.29	126.79	−16 0 17.0	−431.7	64.43	14 57.4	54 46.8	I. N.
17	3 37.05	2.040	15 23 45.71	132.62	−18 30 4.3	−312.6	66.01	15 5.6	55 16.9	I. N.
18	4 27.19	2.136	16 17 58.87	138.39	−20 6 54.0	−167.0	67.53	15 16.0	55 55.1	I. N.
19	5 19.49	2.218	17 14 21.68	143.29	−20 40 44.9	+ 1.3	68.79	15 28.5	56 40.8	I. N.
20	6 13.45	2.274	18 12 24.93	146.68	−20 3 50.5	184.9	69.63	15 42.7	57 33.3	I. n. S.
21	7 8.41	2.301	19 11 28.23	148.30	−18 12 23.9	+371.7	70.00	15 58.0	58 29.4	I. S.
22	8 3.72	2.304	20 10 52.14	148.50	−15 8 10.7	546.1	70.00	16 13.4	59 25.9	I. S.
23	8 58.93	2.296	21 10 10.51	147.98	−10 59 22.7	691.6	69.80	16 27.3	60 16.9	I. S.
24	9 53.95	2.291	22 9 16.98	147.64	− 6 0 43.6	793.0	69.66	16 38.2	60 56.9	I. S.
25	10 48.96	2.298	23 8 23.68	148.09	− 0 32 45.0	836.5	69.71	16 44.4	61 19.7	I. n. S.
26	11 44.36	2.322	0 7 53.06	149.52	+ 4 59 49.2	+815.2	70.05	16 45.0	61 21.9	I. II. N.
27	12 40.48	2.356	1 8 5.87	151.60	10 10 39.0	729.2	70.57	16 39.8	61 2.8	II. N.
28	13 37.41	2.387	2 9 7.98	153.44	14 35 6.0	586.3	71.06	16 29.4	60 24.7	II. N.
29	14 34.86	2.394	3 10 40.44	153.93	17 53 42.5	402.7	71.24	16 15.2	59 32.5	II. N.
30	15 32.06	2.365	4 11 58.71	152.17	+19 54 55.2	+202.2	70.87	15 58.9	58 32.7	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	16 28.05	2.294	5 12 3.78	147.88	+20 36 0.9	+ 5.4	69.88	15 42.5	57 32.5	II. N.
2	17 21.91	2.191	6 10 0.99	141.67	20 1 57.7	−171.4	68.37	15 27.1	56 35.7	II. N. S.
3	18 13.08	2.073	7 5 16.10	134.75	18 22 45.0	−319.5	66.58	15 13.6	55 46.3	II. S.
4	19 1.43	1.958	7 57 41.21	127.65	15 50 27.4	−436.8	64.78	15 2.7	55 6.3	II. S.
5	19 47.20	1.860	8 47 31.53	121.74	12 37 11.3	−524.8	63.17	14 54.4	54 35.7	II. S.
6	20 30.89	1.787	9 35 17.69	117.36	+ 8 54 2.3	−586.2	61.92	14 48.6	54 14.6	II. S.
7	21 13.20	1.742	10 21 38.87	114.70	4 50 58.8	−624.6	61.12	14 45.3	54 2.4	II. S.
8	21 54.78	1.728	11 7 17.23	113.81	+ 0 37 14.0	−640.1	60.81	14 44.2	53 58.2	II. S.
9	22 36.36	1.742	11 52 55.37	114.65	− 3 38 12.7	−633.1	60.99	14 44.9	54 0.7	II. S.
10	23 18.61	1.783	12 39 13.81	117.13	− 7 46 5.7	−602.1	61.64	14 47.2	54 9.4	II. N. S.
12	0 2.14	1.848	13 26 49.05	121.01	−11 36 31.8	−545.6	62.68	14 51.0	54 23.1	I. N.
13	0 47.43	1.929	14 16 10.54	125.91	−14 58 53.7	−461.5	64.00	14 56.0	54 41.6	I. N.
14	1 34.79	2.018	15 7 36.64	131.28	−17 42 2.6	−349.3	65.44	15 2.3	55 4.7	I. N.
15	2 24.27	2.103	16 1 10.23	136.40	−19 34 58.2	−211.0	66.82	15 9.8	55 32.5	I. N.
16	3 15.62	2.172	16 56 36.05	140.51	−20 27 55.9	− 50.7	67.94	15 18.7	56 5.1	I. N.
17	4 8.31	2.214	17 53 22.45	143.07	−20 13 47.5	+122.7	68.63	15 29.0	56 42.7	I. N. S.
18	5 1.67	2.228	18 50 49.57	143.94	−18 49 21.4	298.7	68.88	15 40.4	57 24.6	I. S.
19	5 55.11	2.222	19 48 21.39	143.56	−16 16 5.6	464.9	68.80	15 52.7	58 9.9	I. S.
20	6 48.28	2.209	20 45 37.06	142.74	−12 40 15.9	609.6	68.58	16 5.4	58 56.5	I. S.
21	7 41.19	2.203	21 42 36.60	142.36	− 8 12 39.0	722.1	68.44	16 17.5	59 40.9	I. S.
22	8 34.15	2.214	22 39 39.27	143.09	− 3 8 16.0	+791.9	68.56	16 27.7	60 18.4	I. S.
23	9 27.68	2.251	23 37 16.92	145.98	+ 2 13 52.5	809.4	69.04	16 34.7	60 44.1	I. S.
24	10 22.37	2.310	0 36 3.54	148.77	7 31 15.7	767.3	69.84	16 37.4	60 54.0	I. S.
25	11 18.58	2.375	1 36 22.07	152.77	12 19 23.6	663.4	70.78	16 35.0	60 45.5	I. N. S.
26	12 16.28	2.428	2 38 10.18	155.98	16 14 37.6	504.9	71.54	16 27.8	60 18.7	II. N.
27	13 14.85	2.444	3 40 50.71	156.88	+18 58 9.0	+308.4	71.82	16 16.2	59 36.3	II. N.
28	14 13.15	2.404	4 43 14.87	154.54	20 19 39.8	+ 99.2	71.31	16 1.8	58 43.2	II. N.
29	15 9.85	2.312	5 44 2.54	148.97	20 18 59.7	− 98.8	70.03	15 46.0	57 45.4	II. N. S.
30	16 3.87	2.186	6 42 9.26	141.39	19 4 27.9	−268.1	68.22	15 30.5	56 48.5	II. S.
31	16 54.70	2.050	7 37 3.63	133.90	16 49 12.3	−402.2	66.19	15 16.5	55 56.9	II. S.
Nov. 1	17 42.37	1.926	8 28 48.59	125.75	+13 47 26.5	−501.3	64.28	15 4.8	55 13.9	II. S.
2	18 27.37	1.829	9 17 52.28	119.60	10 12 12.9	−570.8	62.70	14 55.9	54 41.1	II. S.
3	19 10.39	1.763	10 4 57.00	115.89	6 14 39.4	−613.7	61.59	14 49.8	54 18.9	II. S.
4	19 52.24	1.730	10 50 51.24	113.97	+ 2 4 14.0	−634.9	61.02	14 46.6	54 7.2	II. S.
5	20 33.73	1.733	11 36 24.36	114.11	− 2 10 20.9	−635.3	60.99	14 46.2	54 5.5	II. S.
6	21 15.67	1.768	12 22 24.33	116.19	− 6 21 4.2	−613.9	61.49	14 48.1	54 12.4	II. S.
7	21 58.79	1.830	13 9 35.04	119.97	−10 18 21.7	−568.3	62.45	14 51.9	54 26.6	II. S.
8	22 43.70	1.915	13 58 33.45	125.07	−13 52 6.7	−495.6	63.76	14 57.3	54 46.6	II. S.
9	23 30.81	2.012	14 49 44.56	130.97	−16 50 53.3	−393.1	65.25	15 3.9	55 10.7	II. N. S.
11	0 20.25	2.106	15 43 15.56	136.58	−19 2 40.6	−261.0	66.71	15 11.3	55 37.8	I. N. s.
12	1 11.76	2.181	16 38 51.09	141.11	−20 16 16.6	−103.3	67.88	15 19.2	56 6.8	I. N. s.
13	2 4.71	2.224	17 35 53.41	143.71	−20 23 11.9	+ 70.4	68.58	15 27.1	56 36.9	I. N. S.
14	2 58.26	2.231	18 33 31.51	144.10	−19 19 29.8	247.3	68.75	15 35.8	57 7.7	I. S.
15	3 51.58	2.209	19 30 56.44	142.74	−17 6 45.0	413.5	68.48	15 44.4	57 39.2	I. S.
16	4 44.17	2.172	20 27 36.60	140.56	−13 51 42.5	+558.5	67.98	15 52.9	58 10.7	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 16	4 44.17	2.172	20 27 36.60	140.56	−13 51 42.5	+558.5	67.98	15 52.9	58 10.7	I. S.
17	5 35.90	2.140	21 23 25.75	138.67	− 9 45 9.9	669.2	67.53	16 1.3	58 41.6	I. S.
18	6 27.09	2.125	22 18 42.15	137.96	− 5 0 46.5	745.3	67.35	16 9.3	59 10.8	I. S.
19	7 18.34	2.147	23 14 2.06	139.02	+ 0 5 34.0	778.5	67.59	16 16.1	59 36.0	I. S.
20	8 10.39	2.196	0 10 10.05	141.96	5 15 49.7	764.1	68.27	16 21.1	59 54.0	I. S.
21	9 3.93	2.270	1 7 47.95	146.39	+10 9 53.5	+697.1	69.31	16 23.3	60 2.3	I. S.
22	9 59.39	2.351	2 7 21.03	151.33	14 26 18.8	576.2	70.45	16 22.1	59 57.9	I. S.
23	10 56.67	2.416	3 8 43.86	155.25	17 44 28.2	407.8	71.35	16 17.2	59 40.0	I. S.
24	11 55.02	2.436	4 11 11.19	156.45	19 48 9.0	+207.3	71.63	16 8.9	59 9.2	I. II. N. S.
25	12 53.14	2.395	5 13 24.27	154.00	20 29 18.8	− 0.6	71.06	15 57.6	58 27.8	II. N. S.
26	13 49.56	2.298	6 13 55.29	148.11	+19 49 50.6	−192.7	69.70	15 44.5	57 40.0	II. S.
27	14 43.17	2.166	7 11 37.28	140.18	17 59 58.9	−350.9	67.80	15 30.9	56 50.0	II. S.
28	15 33.49	2.026	8 6 1.16	131.65	15 14 23.8	−470.8	65.74	15 17.9	56 2.2	II. S.
29	16 20.64	1.905	8 57 14.52	124.48	11 48 21.8	−554.0	63.88	15 6.6	55 20.6	II. S.
30	17 5.17	1.812	9 45 50.52	118.85	7 55 27.0	−606.0	62.41	14 57.6	54 47.6	II. S.
Dec. 1	17 47.87	1.753	10 32 35.99	115.31	+ 3 46 52.5	−632.9	61.46	14 51.4	54 24.7	II. S.
2	18 29.60	1.731	11 18 23.10	113.99	− 0 28 4.0	−638.4	61.10	14 48.3	54 13.3	II. S.
3	19 11.24	1.746	12 4 5.04	114.87	− 4 41 8.3	−623.7	61.30	14 48.2	54 12.8	II. S.
4	19 53.65	1.795	12 50 33.30	117.82	− 8 44 10.9	−587.8	62.06	14 50.9	54 22.9	II. S.
5	20 37.62	1.874	13 38 34.79	122.59	−12 28 13.2	−526.5	63.27	14 56.2	54 42.3	II. S.
6	21 23.77	1.975	14 28 47.92	128.68	−15 42 51.1	−440.1	64.81	15 3.5	55 9.2	II. S.
7	22 12.49	2.085	15 21 35.89	135.31	−18 16 10.4	−321.2	66.45	15 12.3	55 41.4	II. S.
8	23 3.79	2.186	16 16 58.65	141.38	−19 55 42.5	−171.7	67.93	15 21.8	56 16.5	II. S.
9	23 57.18	2.257	17 14 27.83	145.66	−20 30 15.5	+ 2.0	68.98	15 31.5	56 51.9	I. S.
11	0 51.79	2.285	18 13 9.45	147.34	−19 52 34.3	186.7	69.41	15 40.6	57 25.5	I. S.
12	1 46.52	2 269	19 11 58.94	146.40	−18 1 37.2	+365.5	69.22	15 48.8	57 55.4	I. S.
13	2 40.47	2.224	20 10 1.83	143.65	−15 3 13.7	521.7	68.60	15 55.6	58 20.6	I. S.
14	3 33.20	2.169	21 6 49.84	140.37	−11 8 56.4	643.5	67.84	16 0.9	58 40.8	I. S.
15	4 24.70	2.126	22 2 25.32	137.78	− 6 33 50.9	725.0	67.25	16 5.3	58 56.1	I. S.
16	5 15.46	2.109	22 57 15.91	136.74	− 1 34 43.5	763.4	67.02	16 8.2	59 6.8	I. S.
17	6 6.18	2.124	23 52 4.45	137.64	+ 3 30 59.4	+757.7	67.26	16 10.0	59 13.4	I. S.
18	6 57.67	2.172	0 47 38.30	140.46	8 25 26.8	706 9	67.95	16 10.4	59 14.9	I. S.
19	7 50.57	2.240	1 44 37.69	144.64	12 50 26.6	610.3	68.95	16 9.4	59 11.2	I. S.
20	8 45.24	2.313	2 43 23.31	149.09	16 27 58.1	470.3	69.98	16 6.6	59 0.9	I. S.
21	9 41.49	2.368	3 43 44.44	152.31	19 1 51.0	293.9	70.68	16 1.8	58 43.0	I. S.
22	10 38.55	2.378	4 44 53.86	152.91	+20 20 29.4	+ 97.2	70.77	15 55.0	58 18.4	I. S.
23	11 35.17	2.331	5 45 37.22	150.19	20 19 39.3	− 99.6	70.08	15 46.4	57 46.6	I. S.
24	12 30.07	2.237	6 44 36.76	144.43	19 3 32.9	−276.2	68.69	15 36.3	57 9.7	II. S.
25	13 22.31	2.114	7 40 56.33	137.05	16 43 16.2	−419.1	66.88	15 25.6	56 30.3	II. S.
26	14 11.53	1.989	8 34 14.17	129.51	13 33 29.5	−523.6	65.00	15 15.0	55 51.4	II. S.
27	14 57.91	1.880	9 24 40.71	122.94	+ 9 49 14.1	−592.2	63.34	15 5.3	55 15.9	II. S.
28	15 41.98	1.798	10 12 48.65	118.04	5 43 54.5	−629.7	62.09	14 57.3	54 46.4	II. S.
29	16 24.49	1.750	10 59 22.78	115.10	+ 1 28 44.0	−642 2	61.36	14 51.6	54 25.5	II. S.
30	17 6.27	1.738	11 45 13.37	114.42	− 2 46 56.9	−632.8	61.20	14 48.7	54 14.7	II. S.
31	17 48.19	1.761	12 31 11.98	115.82	− 6 54 52.6	−603.4	61.60	14 48.6	54 14.6	II. S.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	23 51.4	18 36 19.34	−24 46 50.9	6.2	2.3	0.17	Feb. 16	0 50.3	22 36 44.96	− 5 22 1.2	12.5	4.7	0.31
1	23 54.5	18 43 23.30	24 44 26.0	6.2	2.3	0.17	17	0 43.7	22 34 7.36	5 26 8.9	12.8	4.8	0.32
2	23 57.6	18 50 28.45	24 40 33.7	6.2	2.3	0.17	18	0 36.7	22 31 2.41	5 34 49.2	13.1	4.9	0.32
4	0 0.8	18 57 34.67	24 35 13.0	6.2	2.3	0.17	19	0 29.3	22 27 34.78	5 47 44.1	13.4	5.0	0.33
5	0 3.9	19 4 41.82	24 28 23.0	6.2	2.3	0.17	20	0 21.7	22 23 49.80	6 4 28.0	13.6	5.1	0.34
6	0 7.1	19 11 49.81	−24 20 2.8	6.2	2.3	0.17	21	0 13.8	22 19 53.25	− 6 24 30.4	13.8	5.1	0.34
7	0 10.3	19 18 58.50	24 10 11.3	6.2	2.3	0.17	22	0 5.8	22 15 51.06	6 47 16.2	13.9	5.2	0.35
8	0 13.5	19 26 7.74	23 58 47.7	6.2	2.3	0.17	22	23 57.9	22 11 49.15	7 12 7.9	14.0	5.2	0.35
9	0 16.7	19 33 17.38	23 45 51.4	6.3	2.3	0.17	23	23 50.1	22 7 53.13	7 38 26.9	14.0	5.3	0.36
10	0 19.9	19 40 27.27	23 31 21.6	6.3	2.4	0.17	24	23 42.4	22 4 8.11	8 5 35.3	14.0	5.3	0.36
11	0 23.2	19 47 37.24	−23 15 17.6	6.3	2.4	0.17	25	23 35.0	22 0 38.58	− 8 32 57.9	13.9	5.3	0.36
12	0 26.4	19 54 47.10	22 57 38.9	6.3	2.4	0.17	26	23 27.8	21 57 28.24	9 0 3.3	13.9	5.2	0.36
13	0 29.6	20 1 56.66	22 38 25.3	6.3	2.4	0.17	27	23 21.1	21 54 40.01	9 26 23.5	13.8	5.2	0.35
14	0 32.8	20 9 5.71	22 17 36.6	6.4	2.4	0.17	28	23 14.8	21 52 16.02	9 51 35.1	13.6	5.1	0.34
15	0 36.0	20 16 14.00	21 55 12.8	6.4	2.4	0.17	Mar. 1	23 8.9	21 50 17.69	10 15 19.5	13.4	5.1	0.34
16	0 39.1	20 23 21.29	−21 31 13.8	6.4	2.5	0.17	2	23 3.5	21 48 45.79	−10 37 22.1	13.2	5.0	0.33
17	0 42.3	20 30 27.28	21 5 40.1	6.5	2.5	0.18	3	22 58.4	21 47 40.50	10 57 32.3	13.0	5.0	0.33
18	0 45.4	20 37 31.64	20 38 32.4	6.5	2.5	0.18	4	22 53.8	21 47 1.60	11 15 42.0	12.8	4.9	0.32
19	0 48.5	20 44 34.04	20 9 51.8	6.6	2.5	0.18	5	22 49.7	21 46 48.48	11 31 46.7	12.6	4.8	0.32
20	0 51.5	20 51 34.06	19 39 39.6	6.6	2.5	0.18	6	22 46.0	21 47 0.27	11 45 43.4	12.4	4.7	0.32
21	0 54.5	20 58 31.24	−19 7 57.5	6.7	2.6	0.18	7	22 42.6	21 47 35.89	−11 57 31.3	12.2	4.6	0.31
22	0 57.5	21 5 25.05	18 34 48.2	6.8	2.6	0.18	8	22 39.7	21 48 34.14	12 7 10.3	12.0	4.5	0.31
23	1 0.4	21 12 14.89	18 0 14.7	6.9	2.6	0.19	9	22 37.0	21 49 53.79	12 14 41.8	11.8	4.5	0.30
24	1 3.2	21 19 0.09	17 24 20.7	7.0	2.6	0.19	10	22 34.7	21 51 33.57	12 20 7.6	11.5	4.4	0.30
25	1 5.9	21 25 39.85	16 47 10.8	7.1	2.7	0.19	11	22 32.8	21 53 32.19	12 23 29.9	11.3	4.3	0.29
26	1 8.5	21 32 13.29	−16 8 50.8	7.2	2.7	0.19	12	22 31.1	21 55 48.40	−12 24 51.3	11.1	4.2	0.29
27	1 11.0	21 38 39.40	15 29 27.7	7.4	2.8	0.19	13	22 29.7	21 58 20.98	12 24 14.7	10.9	4.1	0.29
28	1 13.3	21 44 57.00	14 49 9.7	7.5	2.8	0.20	14	22 28.6	22 1 8.78	12 21 43.0	10.7	4.0	0.28
29	1 15.5	21 51 4.79	14 8 6.3	7.7	2.9	0.20	15	22 27.7	22 4 10.72	12 17 19.0	10.6	4.0	0.28
30	1 17.5	21 57 1.29	13 26 28.8	7.8	2.9	0.20	16	22 27.0	22 7 25.78	12 11 5.5	10.4	3.9	0.27
31	1 19.3	22 2 44.85	−12 44 30.2	7.9	3.0	0.20	17	22 26.5	22 10 53.02	−12 3 5.3	10.2	3.8	0.26
Feb. 1	1 20.8	22 8 13.65	12 2 25.4	8.1	3.1	0.21	18	22 26.2	22 14 31.57	11 53 21.2	10.0	3.8	0.26
2	1 22.1	22 13 25.67	11 20 31.4	8.3	3.2	0.21	19	22 26.1	22 18 20.61	11 41 55.6	9.8	3.7	0.25
3	1 23.0	22 18 18.74	10 39 7.4	8.5	3.2	0.22	20	22 26.2	22 22 19.38	11 28 51.0	9.7	3.7	0.25
4	1 23.6	22 22 50.55	9 58 34.1	8.7	3.3	0.22	21	22 26.4	22 26 27.22	11 14 9.9	9.5	3.6	0.24
5	1 23.8	22 26 58.71	− 9 19 13.8	8.9	3.4	0.23	22	22 26.7	22 30 43.52	−10 57 54.4	9.4	3.6	0.24
6	1 23.6	22 30 40.72	8 41 30.8	9.2	3.5	0.24	23	22 27.1	22 35 7.72	10 40 6.6	9.3	3.5	0.23
7	1 22.8	22 33 54.13	8 5 50.4	9.4	3.6	0.24	24	22 27.7	22 39 39.32	10 20 48.6	9.2	3.4	0.23
8	1 21.6	22 36 36.54	7 32 38.4	9.8	3.7	0.25	25	22 28.4	22 44 17.87	10 0 2.3	9.0	3.4	0.23
9	1 19.8	22 38 45.75	7 2 20.6	10.1	3.8	0.26	26	22 29.2	22 49 2.98	9 37 49.3	8.9	3.3	0.22
10	1 17.4	22 40 19.85	− 6 35 22.6	10.4	3.9	0.27	27	22 30.1	22 53 54.29	− 9 14 11.7	8.7	3.3	0.22
11	1 14.4	22 41 17.34	6 12 8.0	10.7	4.1	0.28	28	22 31.1	22 58 51.48	8 49 11.0	8.6	3.2	0.22
12	1 10.8	22 41 37.23	5 52 58.2	11.1	4.2	0.28	29	22 32.2	23 3 54.29	8 22 48.8	8.5	3.2	0.21
13	1 6.6	22 41 19.12	5 38 11.5	11.5	4.3	0.29	30	22 33.4	23 9 2.48	7 55 6.7	8.4	3.2	0.21
14	1 1.8	22 40 23.41	5 28 1.7	11.8	4.5	0.30	31	22 34.7	23 14 15.87	7 26 6.2	8.3	3.1	0.21
15	0 56.3	22 38 51.32	− 5 22 37.4	12.2	4.6	0.30	32	22 36.1	23 19 34.29	− 6 55 48.6	8.2	3.1	0.21
16	0 50.3	22 36 44.96	− 5 22 1.2	12.5	4.7	0.31	33	22 37.5	23 24 57.61	− 6 24 15.4	8.1	3.1	0.21

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	22 36.1	23 19 34.29	− 6 55 48.6	8.2	3.1	0.21	May 18	1 10.0	4 55 18.78	+24 46 58.7	8.0	3.0	0.22
2	22 37.5	23 24 57.61	6 24 15.4	8.1	3.1	0.21	19	1 13.6	5 2 51.67	25 1 1.2	8.1	3.1	0.23
3	22 39.0	23 30 25.73	5 51 28.0	8.0	3.0	0.21	20	1 17.0	5 10 12.81	25 12 40.3	8.3	3.1	0.23
4	22 40.6	23 35 58.58	5 17 27.8	7.9	3.0	0.20	21	1 20.2	5 17 21.58	25 22 1.0	8.4	3.2	0.24
5	22 42.3	23 41 36.12	4 42 16.1	7.8	3.0	0.20	22	1 23.2	5 24 17.42	25 29 9.2	8.6	3.2	0.24
6	22 44.1	23 47 18.34	− 4 5 54.4	7.7	2.9	0.20	23	1 25.9	5 30 59.80	+25 34 10.5	8.8	3.3	0.25
7	22 45.9	23 53 5.25	3 28 24.0	7.7	2.9	0.19	24	1 28.5	5 37 28.26	25 37 10.8	9.0	3.4	0.25
8	22 47.8	23 58 56.89	2 49 46.3	7.6	2.9	0.19	25	1 30.8	5 43 42.38	25 38 16.3	9.2	3.5	0.25
9	22 49.8	0 4 53.32	2 10 2.8	7.5	2.8	0.19	26	1 32.8	5 49 41.72	25 37 33.2	9.4	3.6	0.26
10	22 51.9	0 10 54.61	1 29 14.9	7.4	2.8	0.19	27	1 34.5	5 55 25.88	25 35 7.9	9.6	3.6	0.26
11	22 54.0	0 17 0.87	− 0 47 24.2	7.3	2.8	0.19	28	1 36.1	6 0 54.53	+25 31 6.6	9.8	3.7	0.27
12	22 56.3	0 23 12.24	− 0 4 32.5	7.3	2.7	0.19	29	1 37.4	6 6 7.29	25 25 35.5	10.1	3.8	0.27
13	22 58.6	0 29 28.86	+ 0 39 18.6	7.2	2.7	0.18	30	1 38.4	6 11 3.79	25 18 40.6	10.3	3.8	0.28
14	23 1.0	0 35 50.89	1 24 7.1	7.2	2.7	0.18	31	1 39.1	6 15 43.67	25 10 28.2	10.5	3.9	0.28
15	23 3.5	0 42 18.51	2 9 50.8	7 1	2.7	0.18	June 1	1 39.5	6 20 6.59	25 1 4.3	10.7	4.0	0.29
16	23 6.1	0 48 51.93	+ 2 56 27.3	7.0	2.6	0.18	2	1 39.7	6 24 12.21	+24 50 34.7	11.0	4.1	0.30
17	23 8.8	0 55 31.34	3 43 54.1	6.9	2.6	0.18	3	1 39.5	6 28 0.18	24 39 5.2	11.2	4.2	0.30
18	23 11.6	1 2 16.96	4 32 8.4	6.9	2.6	0.18	4	1 39.1	6 31 30.16	24 26 41.5	11.5	4.3	0.31
19	23 14.5	1 9 9.03	5 21 7.0	6.9	2.6	0.17	5	1 38.3	6 34 41.83	24 13 29.3	11.7	4.4	0.32
20	23 17.6	1 16 7.77	6 10 46.2	6.8	2.6	0.17	6	1 37.3	6 37 34.85	23 59 34.1	12.0	4.5	0.33
21	23 20.7	1 23 13.39	+ 7 1 1.7	6.8	2.6	0.17	7	1 35.9	6 40 8.92	+23 45 1.5	12.2	4.6	0.33
22	23 24.0	1 30 26.08	7 51 48.9	6.8	2.6	0.17	8	1 34.2	6 42 23.77	23 29 57.0	12.5	4.7	0.34
23	23 27.4	1 37 46.03	8 43 2.5	6.8	2.5	0.17	9	1 32.2	6 44 19.15	23 14 25.9	12.8	4.8	0.35
24	23 30.9	1 45 13.40	9 34 36.7	6.7	2.5	0.17	10	1 29.8	6 45 54.84	22 58 33.5	13.1	4.9	0.35
25	23 34.5	1 52 48.29	10 26 24.5	6.7	2.5	0.17	11	1 27.2	6 47 10.70	22 42 25.2	13.4	5.0	0.36
26	23 38.2	2 0 30.75	+11 18 18.4	6.7	2.5	0.17	12	1 24.2	6 48 6.67	+22 26 6.5	13.6	5.1	0.37
27	23 42.1	2 8 20.74	12 10 10.1	6.7	2.5	0.17	13	1 20.9	6 48 42.74	22 9 42.5	13.8	5.2	0.37
28	23 46.1	2 16 18.16	13 1 50.2	6.7	2.5	0.17	14	1 17.2	6 48 59.02	21 53 18.6	14.0	5.3	0.38
29	23 50.3	2 24 22.81	13 53 8.7	6.7	2.5	0.17	15	1 13.2	6 48 55.77	21 37 0.0	14.3	5.4	0.38
30	23 54.5	2 32 34.37	14 43 54.6	6.7	2.5	0.17	16	1 8.9	6 48 33.38	21 20 52.1	14.5	5.5	0.39
May 1	23 58.8	2 40 52.39	+15 33 56.1	6.7	2.5	0.17	17	1 4.3	6 47 52.36	+21 5 0.4	14.8	5.5	0.39
3	0 3.3	2 49 16.27	16 23 1.1	6.7	2.5	0.17	18	0 59.4	6 46 53.49	20 49 30.2	15.0	5.6	0.40
4	0 7.8	2 57 45.29	17 10 56.9	6.7	2.6	0.17	19	0 54.2	6 45 37.66	20 34 26.9	15.2	5.7	0.40
5	0 12.4	3 6 18.59	17 57 30.8	6.8	2.6	0.18	20	0 48.7	6 44 6.01	20 19 55.9	15.4	5.7	0.41
6	0 17.1	3 14 55.22	18 42 30.4	6.8	2.6	0.18	21	0 13.0	6 42 19.98	20 6 2.6	15.5	5.8	0.41
7	0 21.8	3 23 34.08	+19 25 43.7	6.9	2.6	0.18	22	0 37.1	6 40 21.08	+19 52 52.3	15.6	5.9	0.42
8	0 26.5	3 32 13.98	20 6 59.3	6.9	2.6	0.18	23	0 31.0	6 38 11.12	19 40 30.6	15.7	5.9	0.42
9	0 31.2	3 40 53.67	20 46 7.2	7.0	2.6	0.18	24	0 24.8	6 35 52.11	19 29 2.6	15.8	6.0	0.42
10	0 35.9	3 49 31.90	21 22 58.6	7.1	2.7	0.18	25	0 18.4	6 33 26.23	19 18 33.4	15.8	6.0	0.42
11	0 40.5	3 58 7.36	21 57 26.3	7.2	2.7	0.19	26	0 12.0	6 30 55.80	19 9 7.7	15.8	6.0	0.42
12	0 45.1	4 6 38.78	+22 29 24.6	7.3	2.7	0.19	27	0 5.6	6 28 23.25	+19 0 50.0	15.8	6.0	0.42
13	0 49.5	4 15 4.94	22 58 49.4	7.4	2.8	0.19	27	23 59.1	6 25 51.06	18 53 44.2	15.7	5.9	0.41
14	0 53.9	4 23 24.68	23 25 38.4	7.5	2.8	0.20	28	23 52.7	6 23 21.73	18 47 53.8	15.6	5.9	0.41
15	0 58.2	4 31 36.90	23 49 50.6	7.6	2.9	0.20	29	23 46.4	6 20 57.73	18 43 21.7	15.5	5.8	0.41
16	1 2.3	4 39 40.59	24 11 26.7	7.7	2.9	0.21	30	23 40.2	6 18 41.47	18 40 10.0	15.3	5.8	0.41
17	1 6.2	4 47 34.85	+24 30 28.5	7.9	3.0	0.21	31	23 34.1	6 16 35.24	+18 38 19.9	15.1	5.7	0.41
18	1 10.0	4 55 18.78	+24 46 58.7	8.0	3.0	0.22	32	23 28.3	6 14 41.16	+18 37 52.2	14.9	5.6	0.40

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
July 1	23 34.1	6 16 35.24	+18 38 19.9	15 1	5.7	0.41
2	23 28.3	6 14 41.16	18 37 52.2	14.9	5.6	0.40
3	23 22.7	6 13 1.21	18 38 46.3	14.6	5.5	0.40
4	23 17.4	6 11 37.10	18 41 1.0	14.4	5.4	0.39
5	23 12.4	6 10 30.40	18 44 34.1	14.2	5.3	0.38
6	23 7.7	6 9 42.49	+18 49 22 6	13.9	5.2	0.37
7	23 3.3	6 9 14.51	18 55 22.5	13.6	5.1	0.36
8	22 59.2	6 9 7.38	19 2 29.4	13.3	5.0	0.36
9	22 55.5	6 9 21.87	19 10 37.7	13.0	4.9	0.35
10	22 52.1	6 9 58.64	19 19 41.3	12.7	4.8	0.34
11	22 49.2	6 10 58.15	+19 29 33.6	12.4	4.7	0.33
12	22 46.6	6 12 20.75	19 40 7.3	12.1	4.6	0.33
13	22 44.5	6 14 6.67	19 51 14.4	11.8	4.4	0.32
14	22 42.7	6 16 16.04	20 2 46.3	11.5	4.3	0.31
15	22 41.3	6 18 48.95	20 14 34.3	11.2	4.2	0.31
16	22 40.3	6 21 45.41	+20 26 29.1	10.9	4.1	0.30
17	22 39.7	6 25 5.37	20 38 20.8	10.6	4.0	0.29
18	22 39.5	6 28 48.69	20 49 59.3	10.3	3.9	0.28
19	22 39.6	6 32 55.19	21 1 13.8	10.0	3.8	0.27
20	22 40.2	6 37 24.62	21 11 53.1	9.7	3.7	0.27
21	22 41.1	6 42 16.67	+21 21 45.9	9.5	3.6	0.26
22	22 42.4	6 47 30.94	21 30 40.6	9.2	3.5	0.25
23	22 44.0	6 53 6.94	21 38 25.3	9.0	3.4	0.25
24	22 46.0	6 59 4.05	21 44 47.8	8.8	3.3	0.24
25	22 48.4	7 5 21.53	21 49 36.3	8.6	3.3	0.24
26	22 51.1	7 11 58.50	+21 52 39.1	8.4	3.2	0.23
27	22 54.1	7 18 53.92	21 53 45.0	8.2	3.1	0.22
28	22 57.3	7 26 6.57	21 52 43.7	8.0	3.1	0.22
29	23 0.8	7 33 35.08	21 49 25.2	7.8	3.0	0.21
30	23 4.6	7 41 17.92	21 43 41.4	7.7	2.9	0.21
31	23 8.6	7 49 13.38	+21 35 25.5	7.5	2.9	0.20
Aug. 1	23 12.7	7 57 19.65	21 24 32.5	7.4	2.8	0.20
2	23 17.0	8 5 34.85	21 10 59.3	7.3	2.8	0.19
3	23 21.4	8 13 57.02	20 54 44.9	7.2	2.7	0.19
4	23 25.9	8 22 24.20	20 35 50.3	7.1	2.7	0.19
5	23 30.5	8 30 54.48	+20 14 18.6	7.0	2.6	0.19
6	23 35.0	8 39 26.05	19 50 14.1	6.9	2.6	0.18
7	23 39.6	8 47 57.21	19 23 43.4	6.8	2.6	0.18
8	23 44.1	8 56 26.43	18 54 54.1	6.8	2.5	0.18
9	23 48.6	9 4 52.32	18 23 54.8	6.7	2.5	0.18
10	23 53.0	9 13 13.71	+17 50 54.7	6.6	2.5	0.18
11	23 57.3	9 21 29.61	17 16 3.7	6.6	2.5	0.17
13	0 1.5	9 29 39.22	16 39 31.6	6.5	2.5	0.17
14	0 5.6	9 37 41.91	16 1 28.1	6.5	2.5	0.17
15	0 9.6	9 45 37.21	15 22 3.1	6.5	2.5	0.17
16	0 13.4	9 53 24.76	+14 41 25.7	6.5	2.5	0.17
17	0 17.1	10 1 4.37	+13 59 44.6	6.5	2.5	0.17
Aug. 17	0 17.1	10 1 4.37	+13 59 44.6	6.5	2.5	0.17
18	0 20.7	10 8 35.93	13 17 8.2	6.5	2.5	0.17
19	0 24.1	10 15 59.42	12 33 44.3	6.5	2.5	0.17
20	0 27.4	10 23 14.90	11 49 39.9	6.5	2.5	0.17
21	0 30.6	10 30 22.47	11 5 1.7	6.5	2.5	0.17
22	0 33.7	10 37 22.29	+10 19 55.9	6.5	2.5	0.17
23	0 36.6	10 44 14.58	9 34 27.9	6.5	2.5	0.17
24	0 39.4	10 50 59.53	8 48 43.1	6.6	2.5	0.17
25	0 42.1	10 57 37.36	8 2 46.1	6.6	2.5	0.17
26	0 44.6	11 4 8.34	7 16 41.0	6.6	2.5	0.17
27	0 47.1	11 10 32.71	+ 6 30 32.0	6.6	2.5	0.17
28	0 49.4	11 16 50.72	5 44 22.6	6.6	2.5	0.17
29	0 51.7	11 23 2.62	4 58 16.3	6.6	2.5	0.17
30	0 53.9	11 29 8.65	4 12 16.0	6.7	2.5	0.17
31	0 55.9	11 35 9.05	3 26 24.6	6.7	2.5	0.17
Sept. 1	0 57.9	11 41 4.05	+ 2 40 44.7	6.7	2.5	0.17
2	0 59.8	11 46 53.85	1 55 18.7	6.8	2.5	0.17
3	1 1.6	11 52 38.65	1 10 9.2	6.8	2.6	0.17
4	1 3.3	11 58 18.65	+ 0 25 18.2	6.8	2.6	0.17
5	1 4.9	12 3 54.02	− 0 19 12.3	6.9	2.6	0.18
6	1 6.5	12 9 24.92	− 1 3 20.2	6.9	2.6	0.18
7	1 8.0	12 14 51.48	1 47 3.6	7.0	2.7	0.18
8	1 9.4	12 20 13.83	2 30 20.6	7.0	2.7	0.18
9	1 10.7	12 25 32.06	3 13 9.4	7.1	2.7	0.18
10	1 12.0	12 30 46.26	3 55 28.2	7.2	2.7	0.18
11	1 13.2	12 35 56.51	− 4 37 15.3	7.2	2.7	0.18
12	1 14.4	12 41 2.82	5 18 28.8	7.3	2.8	0.19
13	1 15.5	12 46 5.21	5 59 6.8	7.4	2.8	0.19
14	1 16.5	12 51 3.68	6 39 7.5	7.4	2.8	0.19
15	1 17.5	12 55 58.20	7 18 29.0	7.5	2.8	0.19
16	1 18.4	13 0 48.70	− 7 57 9.2	7.6	2.9	0.19
17	1 19.2	13 5 35.08	8 35 6.2	7.6	2.9	0.20
18	1 20.0	13 10 17.21	9 12 17.9	7.7	2.9	0.20
19	1 20.7	13 14 54.94	9 48 41.9	7.8	3.0	0.20
20	1 21.3	13 19 28.06	10 24 15.6	7.9	3.0	0.20
21	1 21.8	13 23 56.32	−10 58 56.6	8.0	3.0	0.20
22	1 22.2	13 28 19.44	11 32 42.2	8.1	3.1	0.21
23	1 22.6	13 32 37.08	12 5 29.3	8.3	3.1	0.21
24	1 22.9	13 36 48.82	12 37 14.6	8.4	3.2	0.21
25	1 23.0	13 40 54.20	13 7 54.9	8.5	3.2	0.22
26	1 23.1	13 44 52.70	−13 37 26.0	8.7	3.3	0.22
27	1 23.0	13 48 43.74	14 5 43.7	8.8	3.3	0.22
28	1 22.7	13 52 26.61	14 32 43.6	8.9	3.4	0.23
29	1 22.3	13 56 0.54	14 58 20.6	9.1	3.4	0.23
30	1 21.8	13 59 24.68	15 22 29.0	9.2	3.5	0.24
31	1 21.1	14 2 38.03	−15 45 2.5	9.3	3.5	0.24
32	1 20.2	14 5 39.50	−16 5 54.2	9.5	3.6	0.25

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	1 21.1	14 2 38.03	−15 45 2.5	9.3	3.5	0.24	Nov. 15	22 41.4	14 23 54.41	−12 19 32.3	7.4	2.8	0.19
2	1 20.2	14 5 39.50	16 5 54.2	9.5	3.6	0.25	16	22 43.1	14 29 31.14	12 52 58.9	7.3	2.8	0.19
3	1 19.1	14 8 27.90	16 24 56.2	9.7	3.7	0.26	17	22 44.9	14 35 13.59	13 26 34.6	7.2	2.7	0.19
4	1 17.7	14 11 1.91	16 42 0.4	9.9	3.7	0.26	18	22 46.7	14 41 1.10	14 0 10.2	7.1	2.7	0.19
5	1 16.1	14 13 20.07	16 56 57.2	10.1	3.8	0.27	19	22 48.6	14 46 53.12	14 33 38.2	7.0	2.7	0.19
6	1 14.2	14 15 20.83	−17 9 36.0	10.3	3.9	0.27	20	22 50.6	14 52 49.24	−15 6 51.5	6.9	2.6	0.18
7	1 11.9	14 17 2.47	17 19 45.1	10.5	3.9	0.28	21	22 52.7	14 58 49.07	15 39 44.2	6.8	2.6	0.18
8	1 9.3	14 18 23.23	17 27 12.0	10.8	4.0	0.28	22	22 54.8	15 4 52.30	16 12 10.8	6.8	2.6	0.18
9	1 6.3	14 19 21.30	17 31 43.0	11.0	4.1	0.29	23	22 57.0	15 10 58.69	16 44 6.7	6.7	2.5	0.18
10	1 2.9	14 19 54.81	17 33 3.4	11.2	4.2	0.30	24	22 59.2	15 17 8.03	17 15 27.6	6.6	2.5	0.18
11	0 59.1	14 20 1.95	−17 30 57.8	11.5	4.3	0.30	25	23 1.4	15 23 20.15	−17 46 9.7	6.6	2.5	0.17
12	0 54.9	14 19 41.05	17 25 10.4	11.7	4.4	0.31	26	23 3.7	15 29 34.93	18 16 9.6	6.5	2.4	0.17
13	0 50.1	14 18 50.70	17 15 25.7	12.0	4.5	0.32	27	23 6.0	15 35 52.26	18 45 24.2	6.5	2.4	0.17
14	0 44.8	14 17 29.87	17 1 29.3	12.2	4.6	0.32	28	23 8.4	15 42 12.05	19 13 50.6	6.4	2.4	0.17
15	0 39.0	14 15 38.06	16 43 9.7	12.4	4.6	0.33	29	23 10.9	15 48 34.23	19 41 26.2	6.4	2.4	0.17
16	0 32.7	14 13 15.58	−16 20 19.0	12.6	4.7	0.33	30	23 13.3	15 54 58.74	−20 8 8.7	6.4	2.4	0.17
17	0 25.9	14 10 23.64	15 52 56.4	12.7	4.8	0.33	Dec. 1	23 15.8	16 1 25.54	20 33 55.9	6.3	2.4	0.17
18	0 18.7	14 7 4.54	15 21 8.1	12.9	4.8	0.34	2	23 18.3	16 7 54.61	20 58 45.7	6.3	2.4	0.17
19	0 11.1	14 3 21.81	14 45 11.2	13.1	4.9	0.34	3	23 20.9	16 14 25.90	21 22 36.0	6.3	2.4	0.17
20	0 3.1	13 59 20.25	14 5 34.8	13.1	5.0	0.34	4	23 23.5	16 20 59.38	21 45 25.1	6.2	2.4	0.17
20	23 55.0	13 55 5.87	−13 23 0.9	13.2	5.0	0.34	5	23 26.2	16 27 35.03	−22 7 11.2	6.2	2.3	0.17
21	23 46.7	13 50 45.64	12 38 23.9	13.2	5.0	0.34	6	23 28.9	16 34 12.82	22 27 52.4	6.2	2.3	0.17
22	23 38.5	13 46 27.27	11 52 48.6	13.1	5.0	0.34	7	23 31.6	16 40 52.74	22 47 27.1	6.2	2.3	0.17
23	23 30.4	13 42 18.66	11 7 26.5	13.0	4.9	0.34	8	23 34.3	16 47 34.75	23 5 53.9	6.1	2.3	0.17
24	23 22.6	13 38 27.55	10 23 32.8	12.8	4.9	0.34	9	23 37.1	16 54 18.80	23 23 11.2	6.1	2.3	0.17
25	23 15.3	13 35 0.99	− 9 42 18.3	12.6	4.8	0.33	10	23 39.9	17 1 4.88	−23 39 17.4	6.1	2.3	0.17
26	23 8.4	13 32 4.96	9 4 47.5	12.3	4.7	0.32	11	23 42.8	17 7 52.95	23 54 10.9	6.1	2.3	0.17
27	23 2.1	13 29 44.14	8 31 53.6	12.0	4.5	0.31	12	23 45.7	17 14 42.95	24 7 50.3	6.1	2.3	0.17
28	22 56.5	13 28 1.73	8 4 15.7	11.7	4.4	0.30	13	23 48.6	17 21 34.83	24 20 14.3	6.1	2.3	0.17
29	22 51.5	13 26 59.47	7 42 19.6	11.4	4.2	0.29	14	23 51.5	17 28 28.53	24 31 21.4	6.1	2.3	0.17
30	22 47.2	13 26 37.84	− 7 26 16.7	11.1	4.1	0.28	15	23 54.5	17 35 24.01	−24 41 10.2	6.1	2.3	0.17
31	22 43.6	13 26 56.15	7 16 6.2	10.8	4.0	0.27	16	23 57.5	17 42 21.17	24 49 39.3	6.1	2.3	0.17
Nov. 1	22 40.6	13 27 52.81	7 11 37.4	10.5	3.9	0.26	18	0 0.5	17 49 19.93	24 56 47.3	6.1	2.3	0.17
2	22 38.2	13 29 25.54	7 12 32.4	10.1	3.8	0.26	19	0 3.6	17 56 20.21	25 2 33.1	6.1	2.3	0.17
3	22 36.4	13 31 31.67	7 18 27.4	9.8	3.7	0.25	20	0 6.6	18 3 21.91	25 6 55.2	6.1	2.3	0.17
4	22 35.1	13 34 8.31	− 7 28 55.6	9.5	3.6	0.24	21	0 9.7	18 10 24.91	−25 9 52.3	6.1	2.3	0.17
5	22 34.2	13 37 12.42	7 43 28.4	9.2	3.5	0.24	22	0 12.8	18 17 29.11	25 11 23.1	6.1	2.3	0.17
6	22 33.7	13 40 41.07	8 1 37.3	9.0	3.4	0.23	23	0 16.0	18 24 34.36	25 11 26.6	6.2	2.3	0.17
7	22 33.6	13 44 31.47	8 22 54.0	8.7	3.3	0.23	24	0 19.1	18 31 40.51	25 10 1.6	6.2	2.3	0.17
8	22 33.8	13 48 41.00	8 46 52.1	8.5	3.2	0.22	25	0 22.3	18 38 47.41	25 7 6.8	6.2	2.3	0.18
9	22 34.3	13 53 7.32	− 9 13 6.6	8.3	3.1	0.22	26	0 25.5	18 45 54.89	−25 2 41.2	6.3	2.4	0.18
10	22 35.1	13 57 48.29	9 41 15.0	8.1	3.1	0.21	27	0 28.7	18 53 2.76	24 56 43.9	6.3	2.4	0.18
11	22 36.1	14 2 41.99	10 10 56.7	8.0	3.0	0.21	28	0 31.8	19 0 10.80	24 49 14.1	6.3	2.4	0.17
12	22 37.2	14 7 46.77	10 41 52.8	7.8	3.0	0.20	29	0 35.0	19 7 18.77	24 40 10.9	6.4	2.4	0.17
13	22 38.4	14 13 1.24	11 13 46.8	7.7	2.9	0.20	30	0 38.2	19 14 26.42	24 29 33.6	6.4	2.4	0.17
14	22 39.8	14 18 24.14	−11 46 24.3	7.5	2.9	0.20	31	0 41.4	19 21 33.47	−24 17 21.7	6.5	2.4	0.18
15	22 41.4	14 23 54.41	−12 19 32.3	7.4	2.8	0.19	32	0 44.5	19 28 39.61	−24 3 34.9	6.5	2.4	0.18

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	23 11.4	17 56 13.71	−23 22 25.0	5.3	5.1	0.37	Feb. 16	0 12.1	21 58 30.94	−13 48 41.4	5.2	5.0	0.34
1	23 12.9	18 1 42.65	23 25 1.8	5.3	5.1	0.37	17	0 13.0	22 3 22.34	13 23 25.9	5.2	5.0	0.34
2	23 14.5	18 7 11.79	23 26 55.1	5.3	5.1	0.37	18	0 13.9	22 8 12.62	12 57 48.7	5.2	5.0	0.34
3	23 16.0	18 12 41.05	23 28 4.9	5.3	5.1	0.37	19	0 14.8	22 13 1.81	12 31 50.6	5.2	5.0	0.34
4	23 17.6	18 18 10.37	23 28 31.1	5.3	5.1	0.37	20	0 15.7	22 17 49.93	12 5 32.4	5.2	5.0	0.34
5	23 19.1	18 23 39.70	−23 28 13.7	5.3	5.1	0.37	21	0 16.5	22 22 37.01	−11 38 54.8	5.2	5.0	0.34
6	23 20.6	18 29 8.98	23 27 12.5	5.3	5.1	0.37	22	0 17.4	22 27 23.07	11 11 58.6	5.2	5.0	0.34
7	23 22.1	18 34 38.14	23 25 27.6	5.3	5.1	0.37	23	0 18.2	22 32 8.14	10 44 44.6	5.2	5.0	0.34
8	23 23.7	18 40 7.13	23 22 59.2	5.3	5.1	0.37	24	0 19.0	22 36 52.24	10 17 13.6	5.2	5.0	0.34
9	23 25.2	18 45 35.87	23 19 47.1	5.3	5.1	0.37	25	0 19.8	22 41 35.42	9 49 26.3	5.2	5.0	0.34
10	23 26.8	18 51 4.33	−23 15 51.5	5.3	5.1	0.37	26	0 20.5	22 46 17.69	− 9 21 23.4	5.2	5.0	0.34
11	23 28.3	18 56 32.42	23 11 12.8	5.3	5.1	0.37	27	0 21.2	22 50 59.08	8 53 5.8	5.2	5.0	0.34
12	23 29.8	19 2 0.11	23 5 51.0	5.3	5.1	0.37	28	0 21.9	22 55 39.65	8 24 34.2	5.2	5.0	0.33
13	23 31.3	19 7 27.31	22 59 46.3	5.3	5.1	0.36	Mar. 1	0 22.6	23 0 19.42	7 55 49.4	5.2	5.0	0.33
14	23 32.8	19 12 53.97	22 52 58.9	5.2	5.1	0.36	2	0 23.4	23 4 58.43	7 26 52.1	5.2	5.0	0.33
15	23 34.3	19 18 20.04	−22 45 29.2	5.2	5.1	0.36	3	0 24.1	23 9 36.73	− 6 57 43.0	5.2	5.0	0.33
16	23 35.8	19 23 45.46	22 37 17.5	5.2	5.1	0.36	4	0 24.8	23 14 14.34	6 28 22.9	5.2	5.0	0.33
17	23 37.3	19 29 10.18	22 28 24.2	5.2	5.1	0.36	5	0 25.5	23 18 51.31	5 58 52.5	5.2	5.0	0.33
18	23 38.7	19 34 34.14	22 18 49.7	5.2	5.0	0.36	6	0 26.1	23 23 27.68	5 29 12.5	5.2	5.0	0.33
19	23 40.1	19 39 57.30	22 8 34.3	5.2	5.0	0.36	7	0 26.8	23 28 3.49	4 59 23.6	5.2	5.0	0.33
20	23 41.5	19 45 19.61	−21 57 38.5	5.2	5.0	0.36	8	0 27.4	23 32 38.78	− 4 29 26.7	5.2	5.0	0.33
21	23 42.9	19 50 41.03	21 46 2.8	5.2	5.0	0.36	9	0 28.1	23 37 13.60	3 59 22.5	5.2	5.0	0.33
22	23 44.3	19 56 1.51	21 33 47.6	5.2	5.0	0.36	10	0 28.7	23 41 47.99	3 29 11.6	5.2	5.0	0.33
23	23 45.7	20 1 21.01	21 20 53.4	5.2	5.0	0.36	11	0 29.3	23 46 21.99	2 58 54.9	5.2	5.0	0.33
24	23 47.0	20 6 39.49	21 7 20.9	5.2	5.0	0 36	12	0 29.9	23 50 55.64	2 28 33.0	5.2	5.0	0.33
25	23 48.4	20 11 56.91	−20 53 10.5	5.2	5.0	0.36	13	0 30.5	23 55 29.00	− 1 58 6.7	5.2	5.0	0.33
26	23 49.7	20 17 13.25	20 38 22.9	5.2	5.0	0.36	14	0 31.1	0 0 2.09	1 27 36.9	5.2	5.0	0.33
27	23 51.0	20 29 28.48	20 22 58.5	5.2	5.0	0.36	15	0 31.7	0 4 34.96	0 57 4.1	5.2	5.0	0.33
28	23 52.3	20 27 42.58	20 6 57.9	5.2	5.0	0.36	16	0 32.3	0 9 7.65	− 0 26 29.0	5.2	5.0	0.33
29	23 53.6	20 32 55.52	19 50 22.0	5.2	5.0	0.35	17	0 32.9	0 13 40.20	+ 0 4 7.5	5.2	5.0	0.33
30	23 54.9	20 38 7.29	−19 33 11.3	5.2	5.0	0.35	18	0 33.5	0 18 12.65	+ 0 34 44.7	5.2	5.0	0.33
31	23 56.1	20 43 17.87	19 15 26.3	5.2	5.0	0.35	19	0 34.1	0 22 45.04	1 5 21.8	5.2	5.0	0.33
Feb. 1	23 57.3	20 48 27.25	18 57 7.7	5.2	5.0	0.35	20	0 34.7	0 27 17.43	1 35 58.1	5.2	5.0	0.33
2	23 58.5	20 53 35.42	18 38 16.2	5.2	5.0	0.35	21	0 35.3	0 31 49.84	2 6 32.9	5.2	5.0	0.34
3	23 59.7	20 58 42.37	18 18 52.6	5.2	5.0	0.35	22	0 35.9	0 36 22.32	2 37 5.4	5.2	5.0	0.34
5	0 0.9	21 3 48.09	−17 58 57.5	5.2	5.0	0.35	23	0 36.5	0 40 54.90	+ 3 7 34.9	5.2	5.0	0.34
6	0 2.0	21 8 52.59	17 38 31.6	5.2	5.0	0.35	24	0 37.1	0 45 27.64	3 38 0.5	5.2	5.0	0.34
7	0 3.1	21 13 55.86	17 17 35.6	5.2	5.0	0.35	25	0 37.7	0 50 0.57	4 8 21.7	5.2	5.0	0.34
8	0 4.2	21 18 57.91	16 56 10.3	5.2	5.0	0.35	26	0 38.3	0 54 33.72	4 38 37.7	5.2	5.0	0.34
9	0 5.3	21 23 58.73	16 34 16.4	5.2	5.0	0.35	27	0 38.9	0 59 7.15	5 8 47.7	5.2	5.0	0.34
10	0 6.3	21 28 58.32	−16 11 54.7	5.2	5.0	0.35	28	0 39.5	1 3 40.88	+ 5 38 51.1	5.2	5.0	0.34
11	0 7.3	21 33 56.70	15 49 5.9	5.2	5.0	0.35	29	0 40.1	1 8 14.96	6 8 47.1	5.2	5.0	0.34
12	0 8.3	21 38 53.89	15 25 50.7	5.2	5.0	0.35	30	0 40.8	1 12 49.42	6 38 34.9	5.2	5.0	0.34
13	0 9.3	21 43 49.90	15 2 9.8	5.2	5.0	0.34	31	0 41.4	1 17 24.33	7 8 13.8	5.2	5.0	0.34
14	0 10.2	21 48 44.73	14 38 4.1	5.2	5.0	0.34	32	0 42.1	1 21 59.72	7 37 43.2	5.2	5.0	0.34
15	0 11.2	21 53 38.41	−14 13 34.4	5.2	5.0	0.34	33	0 42.7	1 26 35.63	+ 8 7 2.3	5.2	5.1	0.34
16	0 12.1	21 58 30.94	−13 48 41.4	5.2	5.0	0.34	34	0 43.4	1 31 12.10	+ 8 36 10.3	5.2	5.1	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	0 42.1	1 21 59.72	+ 7 37 43.2	5.2	5.0	0.34	May 17	1 27.7	5 9 5 00	+23 49 14.4	5.7	5.5	0.40
2	0 42.7	1 26 35.63	8 7 2.3	5.2	5.1	0.34	18	1 29.0	5 14 23.17	23 57 39.2	5.7	5.5	0.40
3	0 43.4	1 31 12.10	8 36 10.3	5.2	5.1	0.34	19	1 30.4	5 19 41.89	24 5 22.5	5.7	5.5	0.41
4	0 44.0	1 35 49.16	9 5 6.6	5.3	5.1	0.34	20	1 31.7	5 25 1.07	24 12 24.0	5.7	5.5	0.41
5	0 44.7	1 40 26.84	9 33 50.4	5.3	5.1	0.35	21	1 33.1	5 30 20.68	24 18 43.4	5.8	5.6	0.41
6	0 45.3	1 45 5.20	+10 2 20.9	5.3	5.1	0.35	22	1 34.5	5 35 40.64	+24 24 20.5	5.8	5.6	0.41
7	0 46.0	1 49 44.27	10 30 37.4	5.3	5.1	0.35	23	1 35.9	5 41 0.90	24 29 15.0	5.8	5.6	0.41
8	0 46.7	1 54 24.08	10 58 39.3	5.3	5.1	0.35	24	1 37.3	5 46 21.40	24 33 26.7	5.8	5.6	0.41
9	0 47.4	1 59 4.66	11 26 25.6	5.3	5.1	0.35	25	1 38.7	5 51 42.07	24 36 55.5	5.8	5.6	0.41
10	0 48.2	2 3 46.05	11 53 55.7	5.3	5.1	0.35	26	1 40.1	5 57 2.86	24 39 41.2	5.9	5.6	0.41
11	0 49.0	2 8 28.30	+12 21 8.9	5.3	5.1	0.35	27	1 41.5	6 2 23.70	+24 41 43.7	5.9	5.7	0.41
12	0 49.8	2 13 11.42	12 48 4.3	5.3	5.1	0.35	28	1 42.9	6 7 44.52	24 43 3.0	5.9	5.7	0.42
13	0 50.7	2 17 55.45	13 14 41.2	5.3	5.2	0.36	29	1 44.3	6 13 5.26	24 43 39.0	5.9	5.7	0.42
14	0 51.5	2 22 40.40	13 40 58.9	5.3	5.2	0.36	30	1 45.7	6 18 25.85	24 43 31.7	5.9	5.7	0.42
15	0 52.3	2 27 26.31	14 6 56.6	5.3	5.2	0.36	31	1 47.2	6 23 46.24	24 42 41.1	5.9	5.8	0.42
16	0 53.1	2 32 13.20	+14 32 33.5	5.3	5.2	0.36	June 1	1 48.6	6 29 6.35	+24 41 7.2	6.0	5.8	0.42
17	0 54.0	2 37 1.09	14 57 48.9	5.3	5.2	0.36	2	1 50.0	6 34 26.14	24 38 50.1	6.0	5.8	0.42
18	0 54.9	2 41 49.98	15 22 42.0	5.4	5.2	0.36	3	1 51.4	6 39 45.54	24 35 49.9	6.0	5.8	0.42
19	0 55.8	2 46 39.91	15 47 12.1	5.4	5.2	0.36	4	1 52.7	6 45 4.50	24 32 6.8	6.0	5.8	0.42
20	0 56.7	2 51 30.88	16 11 18.4	5.4	5.2	0.36	5	1 54.1	6 50 22.95	24 27 41.0	6.1	5.9	0.42
21	0 57.6	2 56 22.92	+16 35 0.1	5.4	5.2	0.36	6	1 55.4	6 55 40.83	+24 22 32.5	6.1	5.9	0.43
22	0 58.5	3 1 16.03	16 58 16.5	5.4	5.2	0.36	7	1 56.7	7 0 58.08	24 16 41.8	6.1	5.9	0.43
23	0 59.5	3 6 10.22	17 21 6.9	5.4	5.2	0.37	8	1 58.0	7 6 14.66	24 10 9.0	6.1	5.9	0.43
24	1 0.5	3 11 5.50	17 43 30.6	5.4	5.2	0.37	9	1 59.3	7 11 30.49	24 2 54.6	6.1	5.9	0.43
25	1 1.5	3 16 1.88	18 5 26.7	5.4	5.2	0.37	10	2 0.6	7 16 45.55	23 54 58.6	6.2	5.9	0.43
26	1 2.5	3 20 59.37	+18 26 54.6	5.4	5.2	0.37	11	2 1.9	7 21 59.76	+23 46 21.5	6.2	6.0	0.43
27	1 3.5	3 25 57.95	18 47 53.5	5.4	5.2	0.37	12	2 3.2	7 27 13.09	23 37 3.9	6.2	6.0	0.43
28	1 4.5	3 30 57.62	19 8 22.7	5.4	5.3	0.37	13	2 4.5	7 32 25.48	23 27 5.9	6.2	6.0	0.43
29	1 5.6	3 35 58.40	19 28 21.5	5.4	5.3	0.37	14	2 5.7	7 37 36.87	23 16 28.1	6.2	6.0	0.43
30	1 6.7	3 41 0.28	19 47 49.2	5.5	5.3	0.37	15	2 6.9	7 42 47.22	23 5 10.8	6.3	6.0	0.43
May 1	1 7.8	3 46 3.24	+20 6 45.3	5.5	5.3	0.38	16	2 8.1	7 47 56.50	+22 53 14.7	6.3	6.1	0.43
2	1 8.9	3 51 7.29	20 25 9.0	5.5	5.3	0.38	17	2 9.3	7 53 4.67	22 40 40.3	6.3	6.1	0.43
3	1 10.1	3 56 12.41	20 42 59.6	5.5	5.3	0.38	18	2 10.4	7 58 11.66	22 27 28.0	6.3	6.1	0.44
4	1 11.2	4 1 18.60	21 0 16.5	5.5	5.3	0.38	19	2 11.6	8 3 17.45	22 13 38.4	6.3	6.1	0.44
5	1 12.4	4 6 25.84	21 16 58.9	5.5	5.3	0.38	20	2 12.7	8 8 22.00	21 59 11.9	6.4	6.1	0.44
6	1 13.6	4 11 34.11	+21 33 6.3	5.5	5.3	0.38	21	2 13.8	8 13 25.26	+21 44 9.3	6.4	6.2	0.44
7	1 14.8	4 16 43.38	21 48 38.1	5.6	5.4	0.39	22	2 14.9	8 18 27.23	21 28 31.1	6.4	6.2	0.44
8	1 16.0	4 21 53.64	22 3 33.7	5.6	5.4	0.39	23	2 16.0	8 23 27.87	21 12 17.8	6.5	6.2	0.44
9	1 17.3	4 27 4.86	22 17 52.5	5.6	5.4	0.39	24	2 17.0	8 28 27.16	20 55 30.4	6.5	6.3	0.44
10	1 18.5	4 32 17.00	22 31 33.9	5.6	5.4	0.39	25	2 18.0	8 33 25.09	20 38 9.4	6.5	6.3	0.45
11	1 19.8	4 37 30.04	+22 44 37.4	5.6	5.4	0.39	26	2 19.0	8 38 21.62	+20 20 15.3	6.6	6.3	0.45
12	1 21.1	4 42 43.95	22 57 2.5	5.6	5.4	0.39	27	2 20.0	8 43 16.75	20 1 48.8	6.6	6.4	0.45
13	1 22.4	4 47 58.69	23 8 48.6	5.6	5.5	0.39	28	2 21.0	8 48 10.46	19 42 50.7	6.6	6.4	0.45
14	1 23.7	4 53 14.20	23 19 55.3	5.6	5.5	0.40	29	2 21.9	8 53 2.74	19 23 21.4	6.7	6.4	0.46
15	1 25.0	4 58 30.46	23 30 22.1	5.7	5.5	0.40	30	2 22.8	8 57 53.57	19 3 21.8	6.7	6.5	0.46
16	1 26.3	5 3 47.41	+23 40 8.6	5.7	5.5	0.40	31	2 23.7	9 2 42.97	+18 42 52.5	6.7	6.5	0.46
17	1 27.7	5 9 5.00	+23 49 14.4	5.7	5.5	0.40	32	2 24.5	9 7 30.93	+18 21 54.3	6.7	6.5	0.46

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	2 23.7	9 2 42.97	+18 42 52.5	6.7	6.5	0.46	Aug. 16	2 42.6	12 22 58.02	− 2 31 45.3	8.9	8.6	0.58
2	2 24.5	9 7 30.93	18 21 54.3	6.7	6.5	0.46	17	2 42.7	12 27 0.64	3 2 24.5	9.0	8.7	0.58
3	2 25.4	9 12 17.44	18 0 27.7	6.8	6.6	0.46	18	2 42.8	12 31 2.94	3 33 0.8	9.1	8.7	0.59
4	2 26.2	9 17 2.53	17 38 33.5	6.8	6.6	0.46	19	2 42.8	12 35 4.94	4 3 33.5	9.1	8.8	0.59
5	2 27.0	9 21 46.19	17 16 12.4	6.9	6.6	0.46	20	2 42.9	12 39 6.65	4 34 2.0	9.2	8.9	0.60
6	2 27.8	9 26 28.43	+16 53 25.0	6.9	6.7	0.47	21	2 43.0	12 43 8.11	− 5 4 25.7	9.3	9.0	0.60
7	2 28.6	9 31 9.26	16 30 12.1	6.9	6.7	0.47	22	2 43.1	12 47 9.32	5 34 43.8	9.3	9.0	0.61
8	2 29.3	9 35 48.68	16 6 34.4	7.0	6.7	0.47	23	2 43.1	12 51 10.31	6 4 55.9	9.4	9.1	0.62
9	2 30.0	9 40 26.72	15 42 32.6	7.0	6.8	0.47	24	2 43.2	12 55 11.10	6 35 1.2	9.5	9.2	0.62
10	2 30.6	9 45 3.38	15 18 7.4	7.0	6.8	0.47	25	2 43.3	12 59 11.72	7 4 59.3	9.6	9.2	0.63
11	2 31.2	9 49 38.68	+14 53 19.6	7.1	6.8	0.47	26	2 43.4	13 3 12.18	− 7 34 49.4	9.7	9.3	0.63
12	2 31.8	9 54 12.64	14 28 9.8	7.1	6.9	0.48	27	2 43.5	13 7 12.50	8 4 31.1	9.7	9.4	0.64
13	2 32.4	9 58 45.28	14 2 38.8	7.1	6.9	0.48	28	2 43.6	13 11 12.70	8 34 3.5	9.8	9.5	0.64
14	2 33.0	10 3 16.61	13 36 47.4	7.2	6.9	0.48	29	2 43.6	13 15 12.80	9 3 26.2	9.9	9.6	0.65
15	2 33.6	10 7 46.65	13 10 36.2	7.2	7.0	0.48	30	2 43.7	13 19 12.81	9 32 38.6	10.0	9.7	0.65
16	2 34.1	10 12 15.41	+12 44 5.9	7.2	7.0	0.48	31	2 43.7	13 23 12.75	−10 1 40.1	10.1	9.7	0.66
17	2 34.6	10 16 42.91	12 17 17.4	7.3	7.0	0.48	Sept. 1	2 43.8	13 27 12.63	10 30 30.2	10.2	9.8	0.67
18	2 35.1	10 21 9.19	11 50 11.2	7.3	7.1	0.49	2	2 43.8	13 31 12.47	10 59 8.3	10.3	9.9	0.67
19	2 35.6	10 25 34.27	11 22 48.2	7.3	7.1	0.49	3	2 43.9	13 35 12.29	11 27 33.4	10.4	10.0	0.68
20	2 36.0	10 29 58.14	10 55 9.0	7.4	7.2	0.49	4	2 43.9	13 39 12.10	11 55 45.0	10.5	10.1	0.69
21	2 36.5	10 34 20.85	+10 27 14 5	7.5	7.2	0.49	5	2 44.0	13 43 11.91	−12 23 42.9	10.5	10.2	0.69
22	2 36.9	10 38 42.41	9 59 5.2	7.5	7.3	0.50	6	2 44.0	13 47 11.72	12 51 26.5	10.6	10.3	0.70
23	2 37.3	10 43 2.86	9 30 41.9	7.6	7.3	0.50	7	2 44.1	13 51 11.54	13 18 55.0	10.7	10.4	0.71
24	2 37.7	10 47 22.22	9 2 5.3	7.6	7.4	0.50	8	2 44.1	13 55 11.38	13 46 7.8	10.8	10.5	0.72
25	2 38.1	10 51 40.51	8 33 16.1	7.7	7.4	0.50	9	2 44.2	13 59 11.23	14 13 4.4	10.9	10.6	0.73
26	2 38.4	10 55 57.78	+ 8 4 15.0	7.7	7.5	0.50	10	2 44.2	14 3 11.10	−14 39 44.1	11.0	10.7	0.73
27	2 38.7	11 0 14.03	7 35 2.7	7.8	7.5	0.50	11	2 44.3	14 7 10.96	15 6 6.4	11.2	10.8	0.74
28	2 39.0	11 4 29.31	7 5 39.6	7.8	7.6	0.51	12	2 44.3	14 11 10.81	15 32 10.8	11.3	10.9	0.75
29	2 39.3	11 8 43.64	6 36 6.7	7.9	7.6	0.51	13	2 44.4	14 15 10.62	15 57 56.6	11.4	11.0	0.76
30	2 39.6	11 12 57.06	6 6 24.6	7.9	7.6	0.51	14	2 44.4	14 19 10.41	16 23 23.1	11.5	11.1	0.77
31	2 39.9	11 17 9.59	+ 5 36 34.0	8.0	7.7	0.52	15	2 44.5	14 23 10.12	−16 48 29.9	11.6	11.3	0.78
Aug. 1	2 40.1	11 21 21.28	5 6 35.3	8.0	7.7	0.52	16	2 44.5	14 27 9.74	17 13 16.3	11.7	11.4	0.79
2	2 40.3	11 25 32.15	4 36 29.3	8.1	7.8	0.52	17	2 44.6	14 31 9.25	17 37 41.8	11.8	11.5	0.80
3	2 40.5	11 29 42.24	4 6 16.7	8.1	7.9	0.53	18	2 44.6	14 35 8.61	18 1 45.8	12.0	11.6	0.81
4	2 40.7	11 33 51.58	3 35 58.0	8.2	7.9	0.53	19	2 44.6	14 39 7.78	18 25 27.7	12.1	11.8	0.83
5	2 40.9	11 38 0.23	+ 3 5 33.9	8.2	8.0	0.53	20	2 44.7	14 43 6.72	−18 48 47.0	12.3	11.9	0.84
6	2 41.1	11 42 8.20	2 35 5.1	8.3	8.0	0.54	21	2 44.7	14 47 5.39	19 11 43.1	12.4	12.0	0.85
7	2 41.3	11 46 15.54	2 4 32.2	8.3	8.1	0.54	22	2 44.7	14 51 3.74	19 34 15.5	12.5	12.1	0.86
8	2 41.5	11 50 22.27	1 33 55.7	8.4	8.1	0.54	23	2 44.8	14 55 1.72	19 56 23.8	12.7	12.2	0.87
9	2 41.6	11 54 28.43	1 3 16.5	8.5	8.2	0.55	24	2 44.8	14 58 59.28	20 18 7.4	12.8	12.4	0.88
10	2 41.8	11 58 34.05	+ 0 32 34.9	8.5	8.3	0.55	25	2 44.8	15 2 56.37	−20 39 25.7	13.0	12.5	0.89
11	2 41.9	12 2 39.16	+ 0 1 51.8	8.6	8.3	0.56	26	2 44.8	15 6 52.94	21 0 18.3	13.1	12.6	0.90
12	2 42.1	12 6 43.79	− 0 28 52.2	8.7	8.4	0.56	27	2 44.8	15 10 48.93	21 20 44.8	13.3	12.8	0.92
13	2 42.2	12 10 47.96	0 59 36.9	8.7	8.4	0.57	28	2 44.8	15 14 44.27	21 40 44.7	13.4	12.9	0.93
14	2 42.4	12 14 51.70	1 30 20.8	8.8	8.5	0.57	29	2 44.7	15 18 38.89	22 0 17.5	13.6	13.1	0.95
15	2 42.5	12 18 55.04	− 2 1 3.9	8.8	8.5	0.58	30	2 44.7	15 22 32.75	−22 19 22.9	13.7	13.2	0.96
16	2 42.6	12 22 58.02	− 2 31 45.3	8.9	8.6	0.58	31	2 44.6	15 26 25.72	−22 38 0.5	13.9	13.4	0.98

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	2 44.6	15 26 25.72	−22 38 0.5	13.9	13.4	0.98
2	2 44.6	15 30 17.75	22 56 9.7	14.0	13.6	0.99
3	2 44.5	15 34 8.77	23 13 50.4	14.2	13.7	1.00
4	2 44.4	15 37 58.69	23 31 2.1	14.4	13.9	1.02
5	2 44.3	15 41 47.40	23 47 44.5	14.6	14.1	1.03
6	2 44.1	15 45 34.80	−24 3 57.2	14.8	14.3	1.04
7	2 43.9	15 49 20.78	24 19 39.9	15.0	14.5	1.06
8	2 43.7	15 53 5.22	24 34 52.3	15.2	14.7	1.07
9	2 43.5	15 56 48.00	24 49 34.2	15.4	14.9	1.09
10	2 43.2	16 0 29.00	25 3 45.3	15.6	15.1	1.10
11	2 42.9	16 4 8.08	−25 17 25.4	15.8	15.3	1 12
12	2 42.6	16 7 45.09	25 30 34.2	16.0	15.5	1.14
13	2 42.2	16 11 19.86	25 43 11.5	16.2	15.7	1.16
14	2 41.8	16 14 52.22	25 55 17.1	16.5	15.9	1.18
15	2 41.4	16 18 22.01	26 6 50.9	16.7	16.2	1.20
16	2 40.9	16 21 49.05	−26 17 52.7	16.9	16.4	1.22
17	2 40.4	16 25 13.15	26 28 22.5	17.2	16.6	1.24
18	2 39.8	16 28 34.11	26 38 20.1	17.4	16.9	1.26
19	2 39.1	16 31 51.73	26 47 45.4	17.7	17.1	1.29
20	2 38.4	16 35 5.79	26 56 38.2	17.9	17.4	1.31
21	2 37.6	16 38 16.07	−27 4 58.4	18.2	17.6	1.33
22	2 36.8	16 41 22.36	27 12 46.0	18.5	17.9	1.35
23	2 35.9	16 44 24.43	27 20 0.9	18.8	18.2	1.37
24	2 34.9	16 47 22.04	27 26 43.1	19.1	18.5	1.39
25	2 33.8	16 50 14 95	27 32 52.7	19.4	18.7	1.41
26	2 32.7	16 53 2.91	−27 38 29.6	19.8	19.0	1.44
27	2 31.4	16 55 45.68	27 43 33.6	20.1	19.3	1.46
28	2 30.1	16 58 22.99	27 48 4.6	20.4	19.7	1.49
29	2 28.7	17 0 54.59	27 52 2.5	20.7	20.0	1.51
30	2 27.2	17 3 20.21	27 55 27.5	21.1	20.4	1.53
31	2 25.7	17 5 39.57	−27 58 19.4	21.4	20.7	1.55
Nov. 1	2 24.0	17 7 52.40	28 0 38.0	21.8	21.0	1.58
2	2 22.2	17 9 58.43	28 2 23.2	22.1	21.3	1.60
3	2 20.2	17 11 57.36	28 3 34.8	22.4	21.7	1.63
4	2 18.1	17 13 48.90	28 4 12.6	22.8	22.0	1.65
5	2 15.8	17 15 32.78	−28 4 16.6	23.1	22.4	1.68
6	2 13.5	17 17 8.69	28 3 46.5	23.5	22.7	1.71
7	2 11.0	17 18 36.33	28 2 41.7	23.9	23.1	1.74
8	2 8.4	17 19 55.40	28 1 1.9	24.3	23.5	1.77
9	2 5.7	17 21 5.60	27 58 46.6	24.7	23.9	1.80
10	2 2.8	17 22 6.63	−27 55 55.2	25.2	24.3	1.83
11	1 59.7	17 22 58.23	27 52 27.4	25.6	24.7	1.86
12	1 56.4	17 23 40.14	27 48 22.6	26.0	25.1	1.89
13	1 53.0	17 24 12.10	27 43 39.8	26.4	25.5	1.92
14	1 49.4	17 24 33.87	27 38 18.4	26.9	26.0	1.95
15	1 45.7	17 24 45.24	−27 32 17.6	27.3	26.4	1.98
16	1 41.8	17 24 46.05	−27 25 36.5	27.8	26.8	2.01
Nov. 16	1 41.8	17 24 46.05	−27 25 36.5	27.8	26.8	2.01
17	1 37.7	17 24 36.18	27 18 14.2	28.2	27.2	2.04
18	1 33.4	17 24 15.54	27 10 9.7	28.6	27.6	2.06
19	1 29.0	17 23 44.07	27 1 22.3	29.0	28.0	2.09
20	1 24.4	17 23 1.61	26 51 51.1	29.4	28.4	2.12
21	1 19.6	17 22 8.87	−26 41 35.4	29.8	28.8	2.14
22	1 14.6	17 21 5.42	26 30 34.5	30.2	29.2	2.17
23	1 9.4	17 19 51.70	26 18 47.9	30.6	29.5	2.19
24	1 4.1	17 18 28.05	26 6 15.6	31.0	29.9	2.21
25	0 58.6	17 16 54.87	25 52 57.5	31.3	30.3	2.23
26	0 53.0	17 15 12.66	−25 38 53.9	31.7	30.6	2.25
27	0 47.2	17 13 22.00	25 24 5.7	32.0	30.9	2.26
28	0 41.3	17 11 23.57	25 8 34.3	32.3	31.2	2.28
29	0 35.3	17 9 18.11	24 52 21.2	32.6	31.4	2.30
30	0 29.1	17 7 6.46	24 35 28.7	32.8	31.7	2.31
Dec. 1	0 22.9	17 4 49.50	−24 17 59.8	32.9	31.9	2.32
2	0 16.6	17 2 28.19	23 59 57.5	33.1	32.0	2.33
3	0 10.3	17 0 3.50	23 41 25.9	33.3	32.1	2.33
4	0 4.0	16 57 36.45	23 22 29.1	33.3	32.2	2.34
4	23 57.6	16 55 8.09	23 3 11.8	33.4	32.3	2.34
5	23 51.2	16 52 39.48	−22 43 39.4	33.4	32.3	2.34
6	23 44.8	16 50 11.63	22 23 57.3	33.4	32.3	2.33
7	23 38.4	16 47 45.58	22 4 11.3	33.4	32.2	2.32
8	23 32.1	16 45 22 31	21 44 27.1	33.3	32.1	2.31
9	23 25.9	16 43 2.80	21 24 50.8	33.1	32.0	2.30
10	23 19.7	16 40 47.92	−21 5 28.5	32.9	31.9	2.28
11	23 13.6	16 38 38.50	20 46 25.9	32.8	31.7	2.26
12	23 7.6	16 36 35.31	20 27 48.5	32.6	31.5	2.24
13	23 1.7	16 34 39.05	20 9 41.5	32.3	31.2	2.21
14	22 56.0	16 32 50.34	19 52 9.9	32.0	30.9	2.18
15	22 50.4	16 31 9.74	−19 35 18.1	31.7	30.6	2.16
16	22 45.0	16 29 37.72	19 19 10.1	31.3	30.3	2.14
17	22 39.7	16.28 14.67	19 3 49.2	31.0	30.0	2.11
18	22 34.5	16 27 0.91	18 49 18 4	30.6	29.6	2.09
19	22 29.5	16 25 56.70	18 35 40.2	30.2	29.3	2.06
20	22 24.6	16 25 2.24	−18 22 56.7	29.9	28.9	2.03
21	22 19.9	16 24 17.68	18 11 9.1	29.5	28.5	2.00
22	22 15.4	16 23 43.08	18 0 18.2	29.1	28.1	1.97
23	22 11.1	16 23 18.45	17 50 24.5	28.6	27.7	1.94
24	22 6.9	16 23 3.76	17 41 28.2	28.2	27.2	1.91
25	22 2.9	16 22 58.94	−17 33 28.8	27.7	26.8	1.88
26	21 59.0	16 23 3.91	17 26 25.5	27 3	26.4	1.85
27	21 55.3	16 23 18.53	17 20 17.4	26.8	26.0	1.82
28	21 51.8	16 23 42.63	17 15 3.2	26.4	25.5	1.79
29	21 48.4	16 24 16.02	17 10 41.3	26.0	25.1	1.76
30	21 45.2	16 24 58.47	−17 7 9.9	25.6	24.7	1.73
31	21 42.1	16 25 49.78	−17 4 27.2	25.2	24.3	1.70

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	11 33.7	6 16 41.63	+27 2 52.1	14.4	8.2	0.63	Feb. 15	8 7.3	5 51 4.01	+26 38 5.3	9.9	5.7	0.41
1	11 28.1	6 15 1.07	27 4 20.8	14.4	8.2	0.62	16	8 4.1	5 51 45.84	26 36 57.9	9.8	5.6	0.41
2	11 22.6	6 13 22.14	27 5 39.3	14.3	8.2	0.62	17	8 0.9	5 52 30.31	26 35 50.2	9.7	5.5	0.41
3	11 17.0	6 11 44.98	27 6 47.7	14.2	8.1	0.62	18	7 57.7	5 53 17.36	26 34 42.1	9.6	5.5	0.40
4	11 11.5	6 10 9.77	27 7 46.4	14.2	8.1	0:61	19	7 54.6	5 54 6.94	26 33 33.4	9.5	5.4	0.40
5	11 6.0	6 8 36.69	+27 8 35.6	14.1	8.0	0.61	20	7 51.6	5 54 59.01	+26 32 24.0	9.4	5.4	0.40
6	11 0.6	6 7 5.89	27 9 15.6	14.0	8.0	0.61	21	7 48.5	5 55 53.50	26 31 13.8	9.4	5.3	0.39
7	10 55.2	6 5 37.52	27 9 46.7	14.0	8.0	0.60	22	7 45.5	5 56 50.35	26 30 2.8	9.3	5.3	0.39
8	10 49.8	6 4 11.72	27 10 9.3	13.9	7.9	0.60	23	7 42.6	5 57 49.51	26 28 50.8	9.2	5.2	0.39
9	10 44.5	6 2 48.63	27 10 23.7	13.8	7.9	0.59	24	7 39.7	5 58 50.93	26 27 37.8	9.1	5.2	0.38
10	10 39.2	6 1 28.36	+27 10 30.4	13.7	7.8	0.59	25	7 36.8	5 59 54.54	+26 26 23.5	9.0	5.2	0.38
11	10 34.0	6 0 11.03	27 10 29.7	13.6	7.8	0.58	26	7 34.0	6 1 0.29	26 25 7.8	8.9	5.1	0.38
12	10 28.9	5 58 56.76	27 10 22.1	13.5	7.7	0.58	27	7 31.2	6 2 8.13	26 23 50.6	8.9	5.1	0.37
13	10 23.8	5 57 45.65	27 10 7.9	13.4	7.7	0.57	28	7 28.4	6 3 18.01	26 22 31.8	8.8	5.0	0.37
14	10 18.7	5 56 37.80	27 9 47.6	13.3	7.6	0.57	Mar. 1	7 25.7	6 4 29.87	26 21 11.2	8.7	5.0	0.37
15	10 13.7	5 55 33.29	+27 9 21.6	13.2	7.6	0.56	2	7 23.0	6 5 43.65	+26 19 48.7	8.6	4.9	0.36
16	10 8.7	5 54 32.19	27 8 50.5	13.1	7.5	0.56	3	7 20.3	6 6 59.31	26 18 24.2	8.5	4.9	0.36
17	10 3.8	5 53 34.57	27 8 14.5	13.0	7.4	0.55	4	7 17.6	6 8 16.79	26 16 57.5	8.5	4.8	0.36
18	9 59.0	5 52 40.48	27 7 34.0	12.9	7.4	0.55	5	7 15 0	6 9 36.05	26 15 28.4	8.4	4.8	0.35
19	9 54.2	5 51 49.96	27 6 49.5	12.8	7.3	0.54	6	7 12.4	6 10 57.04	26 13 56.8	8.3	4.7	0.35
20	9 49.5	5 51 3.06	+27 6 1.5	12.7	7.2	0.54	7	7 9.9	6 12 19.72	+26 12 22.6	8.2	4.7	0.35
21	9 44.9	5 50 19.80	27 5 10.3	12.6	7.2	0.53	8	7 7.4	6 13 44.06	26 10 45.5	8.1	4.7	0.34
22	9 40.3	5 49 40.20	27 4 16.2	12.5	7.1	0.53	9	7 4.9	6 15 10.01	26 9 5.5	8.1	4.6	0.34
23	9 35.8	5 49 4.27	27 3 19.5	12.4	7.1	0.52	10	7 2.4	6 16 37.54	26 7 22.4	8.0	4.6	0.34
24	9 31.3	5 48 32.02	27 2 20.7	12.3	7.0	0.51	11	6 59.9	6 18 6.61	26 5 36.2	7.9	4.5	0.33
25	9 26.9	5 48 3.43	+27 1 20.0	12.1	6.9	0.51	12	6 57.5	6 19 37.20	+26 3 46.5	7.9	4.5	0.33
26	9 22.5	5 47 38.48	27 0 17.7	12.0	6.9	0.50	13	6 55.1	6 21 9.26	26 1 53.2	7.8	4.4	0.33
27	9 18.2	5 47 17.13	26 59 14.1	11.9	6.8	0.50	14	6 52.7	6 22 42.76	25 59 56.3	7.7	4.4	0.32
28	9 14.0	5 46 59.38	26 58 9.5	11.8	6.8	0.49	15	6 50.4	6 24 17.66	25 57 55.6	7.7	4.4	0.32
29	9 9.9	5 46 45.19	26 57 4.0	11.7	6.7	0.49	16	6 48.0	6 25 53.93	25 55 50.9	7.6	4.3	0.32
30	9 5.8	5 46 34.52	+26 55 57.8	11.6	6.6	0.49	17	6 45.7	6 27 31.54	+25 53 42.1	7.5	4.3	0.32
31	9 1.7	5 46 27.34	26 54 51.1	11.5	6.6	0.48	18	6 43.4	6 29 10.46	25 51 29.1	7.5	4.3	0.31
Feb. 1	8 57.7	5 46 23.59	26 53 44.1	11.4	6.5	0.48	19	6 41.2	6 30 50.65	25 49 11.7	7.4	4.2	0.31
2	8 53.8	5 46 23.22	26 52 36.8	11.3	6.4	0.47	20	6 38.9	6 32 32.07	25 46 49.8	7.4	4.2	0.31
3	8 49.9	5 46 26.19	26 51 29.5	11.1	6.4	0.47	21	6 36.7	6 34 14.70	25 44 23.4	7.3	4.2	0.31
4	8 46.1	5 46 32.45	+26 50 22.1	11.0	6.3	0.46	22	6 34.5	6 35 58.51	+25 41 52.3	7.2	4.1	0.30
5	8 42.3	5 46 41.94	26 49 14.8	10.9	6.2	0.46	23	6 32.3	6 37 43.46	25 39 16.5	7.2	4.1	0.30
6	8 38.6	5 46 54.62	26 48 7.6	10.8	6.2	0.45	24	6 30.1	6 39 29.52	25 36 35.8	7.1	4.1	0.30
7	8 34.9	5 47 10.44	26 47 0.5	10.7	6.1	0.45	25	6 28.0	6 41 16.66	25 33 50.1	7.1	4.0	0.30
8	8 31.3	5 47 29.35	26 45 53.4	10.6	6.1	0.45	26	6 25.9	6 43 4.83	25 30 59.2	7.0	4.0	0.29
9	8 27.7	5 47 51.30	+26 44 46.5	10.5	6.0	0.44	27	6 23.8	6 44 54.01	+25 28 3.1	7.0	4.0	0.29
10	8 24.2	5 48 16.23	26 43 39.7	10.4	5.9	0.44	28	6 21.7	6 46 44.16	25 25 1.7	6.9	3.9	0.29
11	8 20.7	5 48 44.11	26 42 32.9	10.3	5.9	0.43	29	6 19.6	6 48 35.25	25 21 54.9	6.9	3.9	0.28
12	8 17.3	5 49 14.88	26 41 26.1	10.2	5.8	0.43	30	6 17.5	6 50 27.25	25 18 42.5	6.8	3.9	0.28
13	8 13.9	5 49 48.48	26 40 19.3	10.1	5.8	0.42	31	6 15.4	6 52 20.14	25 15 24.6	6.8	3.9	0.28
14	8 10.6	5 50 24.87	+26 39 12.4	10.0	5.7	0.42	32	6 13.4	6 54 13.88	+25 12 1.1	6.7	3.8	0.28
15	8 7.3	5 51 4.01	+26 38 5.3	9.9	5.7	0.41	33	6 11.4	6 56 8.45	+25 8 31.9	6.6	3.8	0.28

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	8 14.4	2 56 47.39	+15 44 42.9	2.0	21.6	1.59	Feb. 15	5 21.5	3 4 42.66	+16 31 17.4	1.8	18.5	1.37
1	8 10.3	2 56 39.80	15 44 28.2	2.0	21.5	1.58	16	5 18.0	3 5 10.23	16 33 26.3	1.7	18.5	1.37
2	8 6.2	2 56 33.02	15 44 17.0	2.0	21.4	1.58	17	5 14.5	3 5 38.43	16 35 37.4	1.7	18.4	1.37
3	8 2.2	2 56 27.06	15 44 9.3	2.0	21.4	1.58	18	5 11.0	3 6 7.26	16 37 50.6	1.7	18.4	1.36
4	7 58.2	2 56 21.91	15 44 5.2	2.0	21.3	1.57	19	5 7.6	3 6 36.72	16 40 5.9	1.7	18.3	1.36
5	7 54.2	2 56 17.59	+15 44 4.6	2.0	21.2	1.57	20	5 4.2	3 7 6.79	+16 42 23.2	1.7	18.3	1.35
6	7 50.2	2 56 14.08	15 44 7.5	2.0	21.2	1.56	21	5 0.8	3 7 37.48	16 44 42.6	1.7	18.2	1.35
7	7 46.2	2 56 11.40	15 44 14.0	2.0	21.1	1.56	22	4 57.4	3 8 8.77	16 47 4.0	1.7	18.1	1.34
8	7 42.3	2 56 9.54	15 44 24.0	2.0	21.0	1.55	23	4 54.0	3 8 40.65	16 49 27.3	1.7	18.1	1.34
9	7 38.3	2 56 8.50	15 44 37.6	2.0	21.0	1.54	24	4 50.6	3 9 13.12	16 51 52.5	1.7	18.0	1.33
10	7 34.4	2 56 8.28	+15 44 54.7	2.0	20.9	1.54	25	4 47.2	3 9 46.17	+16 54 19.5	1.7	18.0	1.33
11	7 30.5	2 56 8.87	15 45 15.3	1.9	20.8	1.53	26	4 43.8	3 10 19.79	16 56 48.3	1.7	17.9	1.33
12	7 26.6	2 56 10.29	15 45 39.5	1.9	20.8	1.53	27	4 40.4	3 10 53.96	16 59 18.7	1.7	17.9	1.32
13	7 22.7	2 56 12.53	15 46 7.2	1.9	20.7	1.52	28	4 37.0	3 11 28.69	+17 1 50.8	1.7	17.9	1.32
14	7 18.8	2 56 15.59	15 46 38.5	1.9	20.6	1.52							
15	7 14.9	2 56 19.47	+15 47 13.2	1.9	20.6	1.51							
16	7 11.1	2 56 24.16	15 47 51.5	1.9	20.5	1.51	Sept. 1	19 5.1	5 51 15.21	+22 57 55.5	1.7	17.8	1.36
17	7 7.2	2 56 29.66	15 48 33.1	1.9	20.4	1.50	2	19 1.8	5 51 50.29	22 58 4.2	1.7	17.8	1.37
18	7 3.4	2 56 35.98	15 49 18.2	1.9	20.4	1.50	3	18 58.4	5 52 24.78	22 58 12.3	1.7	17.8	1.37
19	6 59.6	2 56 43.11	15 50 6.7	1.9	20.3	1.49	4	18 55.1	5 52 58.69	22 58 19.7	1.7	17.9	1.37
20	6 55.8	2 56 51.06	+15 50 58.6	1.9	20.2	1.49	5	18 51.7	5 53 32.00	+22 58 26.6	1.7	17.9	1.38
21	6 52.0	2 56 59.80	15 51 53.8	1.9	20.2	1.49	6	18 48.3	5 54 4.71	22 58 33.0	1.7	17.9	1.38
22	6 48.2	2 57 9.35	15 52 52.4	1.9	20.1	1.48	7	18 44.9	5 54 36.80	22 58 38.9	1.7	18.0	1.38
23	6 44.4	2 57 19.69	15 53 54.3	1.9	20.0	1.48	8	18 41.5	5 55 8.26	22 58 44.3	1.7	18.0	1.39
24	6 40.7	2 57 30.81	15 54 59.6	1.9	20.0	1.47	9	18 38.1	5 55 39.09	22 58 49.2	1.7	18.1	1.39
25	6 37.0	2 57 42.71	+15 56 8.0	1.9	19.9	1.47	10	18 34.7	5 56 9.28	+22 58 53.7	1.7	18.1	1.40
26	6 33.3	2 57 55.41	15 57 19.6	1.9	19.8	1.46	11	18 31.3	5 56 38.83	22 58 57.8	1.7	18.2	1.40
27	6 29.6	2 58 8.87	15 58 34.4	1.9	19.8	1.45	12	18 27.8	5 57 7.71	22 59 1.5	1.7	18.3	1.41
28	6 25.9	2 58 23.09	15 59 52.3	1.8	19.7	1.45	13	18 24.3	5 57 35.92	22 59 4.8	1.7	18.3	1.41
29	6 22.2	2 58 38.07	16 1 13.3	1.8	19.6	1.44	14	18 20.8	5 58 3.45	22 59 7.7	1.7	18.4	1.42
30	6 18.5	2 58 53.80	+16 2 37.2	1.8	19.6	1.44	15	18 17.3	5 58 30.31	+22 59 10.4	1.7	18.5	1.42
31	6 14.8	2 59 10.28	16 4 4.1	1.8	19.5	1.43	16	18 13.8	5 58 56.48	22 59 12.7	1.7	18.5	1.43
Feb. 1	6 11.2	2 59 27.50	16 5 34.0	1.8	19.4	1.43	17	18 10.3	5 59 21.96	22 59 14.8	1.7	18.6	1.43
2	6 7.6	2 59 45.45	16 7 6.8	1.8	19.4	1.43	18	18 6.8	5 59 46.73	22 59 16.7	1.8	18.7	1.44
3	6 4.0	3 0 4.12	16 8 42.5	1.8	19.3	1.42	19	18 3.3	6 0 10.79	22 59 18.4	1.8	18.7	1.44
4	6 0.4	3 0 23.52	+16 10 20.9	1.8	19.2	1.42	20	17 59.7	6 0 34.13	+22 59 19.8	1.8	18.8	1.45
5	5 56.8	3 0 43.63	16 12 2.1	1.8	19.2	1.42	21	17 56.1	6 0 56.74	22 59 21.0	1.8	18.9	1.45
6	5 53.2	3 1 4.44	16 13 46.1	1.8	19.1	1.41	22	17 52.6	6 1 18.63	22 59 22.0	1.8	18.9	1.45
7	5 49.6	3 1 25.96	16 15 32.7	1.8	19.0	1.41	23	17 49.0	6 1 39.78	22 59 22.8	1.8	19.0	1.46
8	5 46.0	3 1 48.16	16 17 21.9	1.8	19.0	1.40	24	17 45.4	6 2 0.19	22 59 23.6	1.8	19.0	1.46
9	5 42.5	3 2 11.06	+16 19 13.8	1.8	18.9	1.40	25	17 41.8	6 2 19.86	+22 59 24.2	1.8	19.1	1.47
10	5 39.0	3 2 34.65	16 21 8.3	1.8	18.8	1.39	26	17 38.2	6 2 38.77	22 59 24.7	1.8	19.1	1.47
11	5 35.5	3 2 58.92	16 23 5.4	1.8	18.8	1.39	27	17 34.6	6 2 56.90	22 59 25.1	1.8	19.2	1.48
12	5 32.0	3 3 23.86	16 25 4.8	1.8	18.7	1.38	28	17 30.9	6 3 14.31	22 59 25.5	1.8	19.2	1.48
13	5 28.5	3 3 49.47	16 27 6.7	1.8	18.6	1.38	29	17 27.2	6 3 30.91	22 59 25.7	1.8	19.3	1.49
14	5 25.0	3 4 15.74	+16 29 10.9	1.8	18.6	1.38	30	17 23.6	6 3 46.75	+22 59 25.9	1.8	19.3	1.49
15	5 21.5	3 4 42.66	+16 31 17.4	1.8	18.5	1.37	31	17 19.9	6 4 1.78	+22 59 26.2	1.8	19.3	1.50

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi diam.	S.T. of Sem Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	17 19.9	6 4 1.78	+22 59 26.2	1.8	19.3	1.50	Nov. 16	14 15.4	6 0 22.08	+23 1 57.0	2.1	22.1	1.70
2	17 16.2	6 4 16.00	22 59 26.5	1.8	19.4	1.50	17	14 11.1	5 59 58.17	23 2 2.1	2.1	22.1	1.70
3	17 12.5	6 4 29.42	22 59 26.9	1.8	19.5	1.50	18	14 6.8	5 59 33.58	23 2 7.1	2.1	22.2	1.70
4	17 8.8	6 4 42.03	22 59 27.4	1.8	19.5	1.51	19	14 2.4	5 59 8.32	23 2 11.9	2.1	22.2	1.71
5	17 5.1	6 4 53.83	22 59 27.8	1.8	19.6	1.51	20	13 58.0	5 58 42.41	23 2 16.5	2.1	22.2	1.71
6	17 1.3	6 5 4.81	+22 59 28.4	1.9	19.7	1.52	21	13 53.7	5 58 15.88	+23 2 20.9	2.1	22.3	1.71
7	16 57.5	6 5 14.95	22 59 29.1	1.9	19.7	1.52	22	13 49.3	5 57 48.74	23 2 25.2	2.1	22.3	1.72
8	16 53.7	6 5 24.27	22 59 29.9	1.9	19.8	1.53	23	13 44.9	5 57 20.99	23 2 29.2	2.1	22.3	1.72
9	16 49.9	6 5 32.74	22 59 30.8	1.9	19.9	1.53	24	13 40.5	5 56 52.68	23 2 33.1	2.1	22.4	1.72
10	16 46.1	6 5 40.37	22 59 31.9	1.9	19.9	1.54	25	13 36.1	5 56 23.80	23 2 36.7	2.1	22.4	1.73
11	16 42.3	6 5 47.14	+22 59 33.1	1.9	20.0	1.54	26	13 31.7	5 55 54.41	+23 2 40.0	2.1	22.4	1.73
12	16 38.5	6 5 53.05	22 59 34.4	1.9	20.1	1.55	27	13 27.2	5 55 24.45	23 2 43.1	2.1	22.5	1.73
13	16 34.7	6 5 58.11	22 59 35.8	1.9	20.1	1.55	28	13 22.7	5 54 54.02	23 2 45.9	2.1	22.5	1.74
14	16 30.8	6 6 2.31	22 59 37.5	1.9	20.2	1.56	29	13 18.3	5 54 23.09	23 2 48.4	2.1	22.5	1.74
15	16 26.9	6 6 5.64	22 59 39.4	1.9	20.3	1.56	30	13 13.9	5 53 51.71	23 2 50.5	2.1	22.6	1.74
16	16 23.0	6 6 8.11	+22 59 41.3	1.9	20.3	1.57	Dec. 1	13 9.4	5 53 19.88	+23 2 52.2	2.1	22.6	1.74
17	16 19.1	6 6 9.72	22 59 43.5	1.9	20.4	1.57	2	13 4.9	5 52 47.65	23 2 53.6	2.1	22.6	1.74
18	16 15.2	6 6 10.46	22 59 45.8	1.9	20.5	1.58	3	13 0.4	5 52 15.03	23 2 54.8	2.1	22.6	1.74
19	16 11.2	6 6 10.33	22 59 48.3	1.9	20.5	1.58	4	12 55.9	5 51 42.04	23 2 55.5	2.1	22.6	1.75
20	16 7.3	6 6 9.34	22 59 51.0	1.9	20.6	1.59	5	12 51.4	5 51 8.69	23 2 55.8	2.1	22.6	1.75
21	16 3.3	6 6 7.47	+22 59 53.8	1.9	20.6	1.59	6	12 46.9	5 50 35.01	+23 2 55.7	2.1	22.7	1.75
22	15 59.3	6 6 4.73	22 59 56.9	1.9	20.7	1.59	7	12 42.4	5 50 1.05	23 2 55.2	2.1	22.7	1.75
23	15 55.3	6 6 1.14	23 0 0.2	1.9	20.7	1.60	8	12 37.9	5 49 26.83	23 2 54.3	2.1	22.7	1.75
24	15 51.3	6 5 56.68	23 0 3.8	2.0	20.8	1.60	9	12 33.4	5 48 52.35	23 2 53.0	2.1	22.7	1.75
25	15 47.3	6 5 51.36	23 0 7.4	2.0	20.8	1.60	10	12 28.9	5 48 17.67	23 2 51.2	2.1	22.7	1.75
26	15 43.3	6 5 45.17	+23 0 11.1	2.0	20.9	1.61	11	12 24.4	5 47 42.80	+23 2 49.1	2.1	22.7	1.75
27	15 39.2	6 5 38.11	23 0 15.0	2.0	21.0	1.61	12	12 19.9	5 47 7.78	23 2 46.5	2.1	22.8	1.76
28	15 35.2	6 5 30.19	23 0 19.2	2.0	21.0	1.62	13	12 15.4	5 46 32.62	23 2 43.4	2.1	22.8	1.76
29	15 31.1	6 5 21.42	23 0 23.5	2.0	21.1	1.62	14	12 10.9	5 45 57.36	23 2 39.9	2.1	22.8	1.76
30	15 27.0	6 5 11.80	23 0 27.9	2.0	21.2	1.63	15	12 6.4	5 45 22.03	23 2 35.9	2.1	22.8	1.76
31	15 22.9	6 5 1.30	+23 0 32.5	2.0	21.2	1.63	16	12 1.9	5 44 46.66	+23 2 31.7	2.1	22.8	1.76
Nov. 1	15 18.8	6 4 49.97	23 0 37.3	2.0	21.3	1.64	17	11 57.4	5 44 11.27	23 2 27.0	2.1	22.8	1.76
2	15 14.7	6 4 37.78	23 0 42.2	2.0	21.4	1.64	18	11 52.8	5 43 35.90	23 2 21.9	2.1	22.8	1.76
3	15 10.6	6 4 24.75	23 0 47.2	2.0	21.4	1.65	19	11 48.2	5 43 0.56	23 2 16.5	2.1	22.8	1.75
4	15 6.4	6 4 10.88	23 0 52.3	2.0	21.5	1.65	20	11 43.7	5 42 25.28	23 2 10.6	2.1	22.8	1.75
5	15 2.2	6 3 56.19	+23 0 57.5	2.0	21.5	1.66	21	11 39.2	5 41 50.10	+23 2 4.4	2.1	22.8	1.75
6	14 58.0	6 3 40.67	23 1 2.8	2.0	21.6	1.66	22	11 34.7	5 41 15.02	23 1 57.9	2.1	22.7	1.75
7	14 53.8	6 3 24.31	23 1 8.2	2.0	21.6	1.67	23	11 30.2	5 40 40.09	23 1 51.0	2.1	22.7	1.75
8	14 49.6	6 3 7.15	23 1 13.6	2.0	21.7	1.67	24	11 25.7	5 40 5.33	23 1 43.8	2.1	22.7	1.75
9	14 45.4	6 2 49.20	23 1 19.0	2.0	21.7	1.67	25	11 21.2	5 39 30.78	23 1 36.3	2.1	22.7	1.75
10	14 41.2	6 2 30.46	+23 1 24.5	2.0	21.8	1.68	26	11 16.7	5 38 56.45	+23 1 28.6	2.1	22.7	1.75
11	14 36.9	6 2 10.93	23 1 30.0	2.1	21.8	1.68	27	11 12.2	5 38 22.33	23 1 20.5	2.1	22.6	1.75
12	14 32.6	6 1 50.64	23 1 35.6	2.1	21.9	1.68	28	11 7.7	5 37 48.49	23 1 12.2	2.1	22.6	1.75
13	14 28.3	6 1 29.59	23 1 41.1	2.1	21.9	1.69	29	11 3.2	5 37 14.93	23 1 3.5	2.1	22.6	1.74
14	14 24.0	6 1 7.81	23 1 46.6	2.1	22.0	1.69	30	10 58.7	5 36 41.70	23 0 54.6	2.1	22.6	1.74
15	14 19.7	6 0 45.31	+23 1 51.9	2.1	22.0	1.69	31	10 54.2	5 36 8.81	+23 0 45.7	2.1	22.6	1.74
16	14 15.4	6 0 22.08	+23 1 57.0	2.1	22.1	1.70	32	10 49.7	5 35 36.28	+23 0 36.6	2.1	22.6	1.74

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	7 34.2	2 16 29.16	+11 3 1.1	1.0	8.9	0.65	Feb. 15	4 38.5	2 21 38.30	+11 43 12.2	0.9	8.2	0.60
1	7 30.2	2 16 26.46	11 3 5.8	1.0	8.9	0.65	16	4 34.8	2 21 54.23	11 44 48.7	0.9	8.2	0.60
2	7 26.3	2 16 24.19	11 3 12.7	1.0	8.9	0.65	17	4 31.1	2 22 10.50	11 46 26.7	0.9	8.2	0.60
3	7 22.3	2 16 22.34	11 3 21.8	1.0	8.9	0.65	18	4 27.5	2 22 27.12	11 48 6.2	0.9	8.2	0.60
4	7 18.3	2 16 20.92	11 3 33.1	1.0	8.9	0.65	19	4 23.8	2 22 44.07	11 49 47.2	0.9	8.2	0.60
5	7 14.4	2 16 19.93	+11 3 46.7	1.0	8.8	0.64	20	4 20.2	2 23 1.36	+11 51 29.6	0.9	8.2	0.59
6	7 10.4	2 16 19.36	11 4 2.5	1.0	8.8	0.64	21	4 16.6	2 23 18.99	11 53 13.5	0.9	8.2	0.59
7	7 6.5	2 16 19.22	11 4 20.5	1.0	8.8	0.64	22	4 12.9	2 23 36.94	11 54 58.7	0.9	8.2	0.59
8	7 2.6	2 16 19.50	11 4 40.7	1.0	8.8	0.64	23	4 9.3	2 23 55.22	11 56 45.3	0.9	8.1	0.59
9	6 58.7	2 16 20.21	11 5 3.2	1.0	8.8	0.64	24	4 5.7	2 24 13.81	11 58 33.3	0.9	8.1	0.59
10	6 54.8	2 16 21.34	+11 5 28.0	1.0	8.8	0.64	25	4 2.0	2 24 32.72	+12 0 22.5	0.9	8.1	0.59
11	6 50.8	2 16 22.90	11 5 54.9	1.0	8.8	0.64	26	3 58.4	2 24 51.94	12 2 13.0	0.9	8.1	0.59
12	6 46.9	2 16 24.89	11 6 24.1	1.0	8.7	0.64	27	3 54.8	2 25 11.46	12 4 4.7	0.9	8.1	0.59
13	6 43.1	2 16 27.31	11 6 55.5	1.0	8.7	0.64	28	3 51.2	2 25 31.29	+12 5 57.7	0.9	8.1	0.58
14	6 39.2	2 16 30.16	11 7 29.2	1.0	8.7	0.64							
15	6 35.3	2 16 33.44	+11 8 5.0	1.0	8.7	0.63							
16	6 31.4	2 16 37.15	11 8 43.0	1.0	8.7	0.63	Sept. 1	16 51.8	3 37 33.46	+17 5 3.9	1.0	8.8	0.66
17	6 27.6	2 16 41.29	11 9 23.1	1.0	8.7	0.63	2	16 47.9	3 37 35.89	17 4 59.9	1.0	8.9	0.66
18	6 23.7	2 16 45.85	11 10 5.4	1.0	8.7	0.63	3	16 44.0	3 37 37.89	17 4 54.4	1.0	8.9	0.66
19	6 19.9	2 16 50.84	11 10 49.8	1.0	8.6	0.63	4	16 40.1	3 37 39.45	17 4 47.5	1.0	8.9	0.66
20	6 16.0	2 16 56.26	+11 11 36.4	1.0	8.6	0.63	5	16 36.1	3 37 40.57	+17 4 39.1	1.0	8.9	0.66
21	6 12.2	2 17 2.10	11 12 25.1	1.0	8.6	0.63	6	16 32.2	3 37 41.25	17 4 29.2	1.0	8.9	0.66
22	6 8.3	2 17 8.36	11 13 15.9	1.0	8.6	0.63	7	16 28.3	3 37 41.50	17 4 17.9	1.0	8.9	0.66
23	6 4.5	2 17 15.04	11 14 8.8	1.0	8.6	0.62	8	16 24.4	3 37 41.30	17 4 5.1	1.0	8.9	0.66
24	6 0.7	2 17 22.14	11 15 3.8	1.0	8.6	0.62	9	16 20.4	3 37 40.66	17 3 50.9	1.0	9.0	0.67
25	5 56.9	2 17 29.65	+11 16 0.8	1.0	8.5	0.62	10	16 16.5	3 37 39.58	+17 3 35.2	1.0	9.0	0.67
26	5 53.1	2 17 37.58	11 16 59.8	1.0	8.5	0.62	11	16 12.5	3 37 38.06	17 3 18.1	1.0	9.0	0.67
27	5 49.3	2 17 45.91	11 18 0.8	1.0	8.5	0.62	12	16 8.5	3 37 36.10	17 2 59.6	1.0	9.0	0.67
28	5 45.5	2 17 54.65	11 19 3.8	1.0	8.5	0.62	13	16 4.6	3 37 33.70	17 2 30.7	1.0	9.0	0.67
29	5 41.7	2 18 3.79	11 20 8.8	1.0	8.5	0.62	14	16 0.6	3 37 30.87	17 2 18.4	1.0	9.0	0.67
30	5 38.0	2 18 13.34	+11 21 15.7	1.0	8.5	0.62	15	15 56.6	3 37 27.60	+17 1 55.7	1.0	9.0	0.67
31	5 34.2	2 18 23.28	11 22 24.5	1.0	8.5	0.62	16	15 52.6	3 37 23.90	17 1 31.5	1.0	9.1	0.67
Feb. 1	5 30.4	2 18 33.62	11 23 35.2	1.0	8.4	0.62	17	15 48.6	3 37 19.76	17 1 5.9	1.0	9.1	0.67
2	5 26.7	2 18 44.35	11 24 47.8	1.0	8.4	0.61	18	15 44.6	3 37 15.19	17 0 38.9	1.0	9.1	0.68
3	5 22.9	2 18 55.47	11 26 2.3	1.0	8.4	0.61	19	15 40.6	3 37 10.20	17 0 10.5	1.0	9.1	0.68
4	5 19.2	2 19 6.98	+11 27 18.6	1.0	8.4	0.61	20	15 36.6	3 37 4.78	+16 59 40.8	1.0	9.1	0.68
5	5 15.5	2 19 18.87	11 28 36.7	1.0	8.4	0.61	21	15 32.5	3 36 58.94	16 59 9.8	1.0	9.1	0.68
6	5 11.7	2 19 31.14	11 29 56.6	1.0	8.4	0.61	22	15 28.5	3 36 52.68	16 58 37.5	1.0	9.1	0.68
7	5 8.0	2 19 43.79	11 31 18.2	0.9	8.4	0.61	23	15 24.5	3 36 46.01	16 58 3.9	1.0	9.2	0.68
8	5 4.3	2 19 56.82	11 32 41.6	0.9	8.3	0.61	24	15 20.4	3 36 38.93	16 57 29.0	1.0	9.2	0.68
9	5 0.6	2 20 10.22	+11 34 6.7	0.9	8.3	0.61	25	15 16.4	3 36 31.44	+16 56 52.8	1.0	9.2	0.68
10	4 56.9	2 20 23.99	11 35 33.5	0.9	8.3	0.60	26	15 12.3	3 36 23.54	16 56 15.3	1.0	9.2	0.68
11	4 53.2	2 20 38.13	11 37 2.0	0.9	8.3	0.60	27	15 8.2	3 36 15.24	16 55 36.6	1.0	9.2	0.69
12	4 49.5	2 20 52.63	11 38 32.1	0.9	8.3	0.60	28	15 4.1	3 36 6.54	16 54 56.6	1.0	9.2	0.69
13	4 45.8	2 21 7.50	11 40 3.9	0.9	8.3	0.60	29	15 0.1	3 35 57.44	16 54 15.4	1.0	9.2	0.69
14	4 42.1	2 21 22.72	+11 41 37.3	0.9	8.3	0.60	30	14 56.0	3 35 47.95	+16 53 32.9	1.0	9.3	0.69
15	4 38.5	2 21 38.30	+11 43 12.2	0.9	8.2	0.60	31	14 51.9	3 35 38.07	+16 52 49.3	1.0	9.3	0.69

FOR TRANSIT AT WASHINGTON.

Date.		Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.		Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem Pass. Mer.
		h m	h m s	° ′ ″	″	″	s			h m	h m s	° ′ ″	″	″	s
Oct.	1	14 51.9	3 35 38.07	+16 52 49.3	1.0	9.3	0.69	Nov.	16	11 38.4	3 23 0.74	+16 4 47.7	1.1	9.6	0.71
	2	14 47.8	3.35 27.80	16 52 4.4	1.0	9.3	0.69		17	11 34.2	3 22 41.09	16 3 38.2	1.1	9.6	0.71
	3	14 43.7	3 35 17.15	16 51 18.4	1.1	9.3	0.69		18	11 29.9	3 22 21.47	16 2 29.1	1.1	9.6	0.71
	4	14 39.5	3 35 6.13	16 50 31.2	1.1	9.3	0.69		19	11 25.7	3 22 1.90	16 1 20.3	1.1	9.6	0.71
	5	14 35.4	3 34 54.73	16 49 42.9	1.1	9.3	0.69		20	11 21.4	3 21 42.39	16 0 12.0	1.1	9 6	0.71
	6	14 31.3	3 34 42 97	+16 48 53.5	1.1	9.3	0.70		21	11 17.1	3 21 22.95	+15 59 4.1	1.1	9.6	0.71
	7	14 27.2	3 34 30.85	16 48 3.0	1.1	9.4	0.70		22	11 12.9	3 21 3.58	15 57 56.7	1.1	9.6	0.71
	8	14 23.0	3 34 18.37	16 47 11.4	1.1	9.4	0.70		23	11 8.6	3 20 44.30	15 56 49.9	1.1	9.6	0.71
	9	14 18.9	3 34 5.54	16 46 18.8	1.1	9.4	0.70		24	11 4.4	3 20 25.12	15 55 43.6	1.1	9.6	0.71
	10	14 14.7	3 33 52.37	16 45 25.2	1.1	9.4	0.70		25	11 0.1	3 20 6 06	15 54 38.0	1.1	9.6	0.71
	11	14 10.6	3 33 38.86	+16 44 30.5	1.1	9.4	0.70		26	10 55.9	3 19 47.11	+15 53 33.0	1.1	9.6	0.71
	12	14 6.4	3 33 25.02	16 43 34.9	1.1	9.4	0.70		27	10 51.6	3 19 28.29	15 52 28.7	1.1	9.6	0.71
	13	14 2.3	3 33 10.86	16 42 38.3	1.1	9.4	0.70		28	10 47.4	3 19 9.61	15 51 25.1	1.1	9.6	0.71
	14	13 58.1	3 32 56.39	16 41 40.8	1.1	9.4	0.70		29	10 43.2	3 18 51.08	15 50 22.3	1.1	9.6	0.71
	15	13 53.9	3 32 41.61	16 40 42.4	1.1	9.4	0.70		30	10 38.9	3 18 32.71	15 49 20.3	1.1	9.5	0.71
	16	13 49.7	3 32 26.53	+16 39 43.1	1.1	9.4	0.70	Dec.	1	10 34.7	3 18 14.51	+15 48 19.2	1.1	9.5	0.71
	17	13 45.5	3 32 11.17	16 38 43.0	1.1	9.5	0.70		2	10 30.5	3 17 56.49	15 47 19.0	1.1	9.5	0.71
	18	13 41.3	3 31 55 52	16 37 42.0	1.1	9.5	0.70		3	10 26.2	3 17 38.66	15 46 19.7	1.1	9.5	0.71
	19	13 37.1	3 31 39.60	16 36 40.3	1.1	9.5	0.70		4	10 22 0	3 17 21.03	15 45 21.4	1.1	9.5	0.71
	20	13 32.9	3 31 23.42	16 35 37.8	1.1	9.5	0.70		5	10 17.8	3 17 3.61	15 44 24.1	1.1	9.5	0 70
	21	13 28.7	3 31 6.98	+16 34 34.6	1.1	9.5	0.71		6	10 13.6	3 16 46.41	+15 43 27.8	1.1	9.5	0.70
	22	13 24.5	3 30 50.30	16 33 30.7	1.1	9.5	0.71		7	10 9.4	3 16 29.44	15 42 32.6	1.1	9.5	0.70
	23	13 20.3	3 30 33.38	16 32 26.2	1.1	9.5	0.71		8	10 5.1	3 16 12.71	15 41 38.6	1.1	9.5	0.70
	24	13 16.1	3 30 16.23	16 31 21.0	1.1	9.5	0.71		9	10 0.9	3 15 56.23	15 40 45.7	1.1	9.5	0.70
	25	13 11.9	3 29 58.86	16 30 15.2	1.1	9.5	0.71		10	9 56.7	3 15 40.02	15 39 54.1	1.1	9.5	0.70
	26	13 7.7	3 29 41.28	+16 29 8.8	1.1	9.5	0.71		11	9 52.5	3 15 24.08	+15 39 3.7	1.1	9.5	0.70
	27	13 3.4	3 29 23.50	16 28 1.9	1.1	9.5	0.71		12	9 48.3	3 15 8.41	15 38 14.5	1.1	9.4	0.70
	28	12 59.2	3 29 5.52	16 26 54.5	1.1	9.5	0.71		13	9 44.2	3 14 53.03	15 37 26.6	1.1	9.4	0.70
	29	12 55.0	3 28 47.36	16 25 46 6	1.1	9.5	0.71		14	9 40.0	3 14 37.95	15 36 40.1	1.1	9.4	0.70
	30	12 50.7	3 28 29.03	16 24 38.3	1.1	9.6	0.71		15	9 35.8	3 14 23.18	15 35 54.9	1.1	9.4	0.70
	31	12 46.5	3 28 10.53	+16 23 29.6	1.1	9.6	0.71		16	9 31.6	3 14 8.71	+15 35 11.1	1.1	9.4	0.70
Nov.	1	12 42.3	3 27 51.88	16 22 20.6	1.1	9.6	0.71		17	9 27.5	3 13 54.56	15 34 28.7	1.1	9.4	0.70
	2	12 38.0	3 27 33.08	16 21 11.2	1.1	9.6	0.71		18	9 23.3	3 13 40.73	15 33 47.7	1.1	9.4	0.70
	3	12 33.8	3 27 14.15	16 20 1.5	1.1	9.6	0.71		19	9 19.1	3 13 27.24	15 33 8.2	1.1	9.4	0.70
	4	12 29.5	3 26 55.10	16 18 51.6	1.1	9.6	0.71		20	9 15.0	3 13 14.08	15 32 30.3	1.1	9.4	0.69
	5	12 25.3	3 26 35.93	+16 17 41.5	1.1	9.6	0.71		21	9 10.8	3 13 1.27	+15 31 53.9	1.1	9.4	0.69
	6	12 21.0	3 26 16.65	16 16 31.1	1.1	9.6	0.71		22	9 6.7	3 12 48.81	15 31 19.0	1.1	9.4	0.69
	7	12 16.8	3 25 57.27	16 15 20.6	1.1	9.6	0.71		22	9 2.6	3 12 36.71	15 30 45.7	1.1	9.3	0.69
	8	12 12.5	3 25 37.81	16 14 10 0	1.1	9.6	0.71		24	8 58.5	3 12 24.97	15 30 14.0	1.1	9.3	0.69
	9	12 8.2	3 25 18.29	16 12 59.4	1.1	9.6	0.71		25	8 54.3	3 12 13.60	15 29 43.9	1.1	9.3	0.69
	10	12 4.0	3 24 58.72	+16 11 48.9	1.1	9.6	0.71		26	8 50.2	3 12 2.61	+15 29 15.5	1.0	9.3	0.69
	11	11 59.7	3 24 39.11	16 10 38.4	1.1	9.6	0.71		27	8 46.1	3 11 51.99	15 28 48.7	1.0	9.3	0.69
	12	11 55.5	3 24 19.46	16 9 27.9	1.1	9.6	0.71		28	8 42.0	3 11 41.76	15 28 23.6	1.0	9.3	0.69
	13	11 51.2	3 23 59.78	16 8 17.6	1.1	9.6	0.71		29	8 37.9	3 11 31.91	15 28 0.2	1.0	9.3	0.68
	14	11 47.0	3 23 40.09	16 7 7.4	1.1	9.6	0.71		30	8 33.8	3 11 22.46	15 27 38.5	1.0	9.2	0.68
	15	11 42.7	3 23 20.41	+16 5 57.4	1.1	9.6	0.71		31	8 29.7	3 11 13.41	+15 27 18.5	1.0	9.2	0.68
	16	11 38.4	3 23 0.74	+16 4 47.7	1.1	9.6	0.71		32	8 25.6	3 11 4.77	+15 27 0.3	1.0	9.2	0.68

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	16 35.3	11 19 5.09	+ 5 15 46.8	0.5	1.9	0.13	Feb. 15	13 30.1	11 14 40.10	+ 5 45 22.0	0.5	1.9	0.13
1	16 31.4	11 19 3.27	5 16 1.1	0.5	1.9	0.13	16	13 26.0	11 14 31.17	5 46 19.4	0.5	1.9	0.13
2	16 27.4	11 19 1.26	5 16 16.6	0.5	1.9	0.13	17	13 21.9	11 14 22.17	5 47 17.4	0.5	1.9	0.13
3	16 23.4	11 18 59.04	5 16 33.4	0.5	1.9	0.13	18	13 17.8	11 14 13.10	5 48 15.7	0.5	1.9	0.13
4	16 19.4	11 18 56.62	5 16 51.5	0.5	1.9	0.13	19	13 13.7	11 14 3.96	5 49 14.3	0.5	1.9	0.13
5	16 15.5	11 18 54.01	+ 5 17 10.8	0.5	1.9	0.13	20	13 9.7	11 13 54.74	+ 5 50 13.4	0.5	1.9	0.13
6	16 11.5	11 18 51.19	5 17 31.3	0.5	1.9	0.13	21	13 5.6	11 13 45.47	5 51 12.8	0.5	1.9	0.13
7	16 7.5	11 18 48.18	5 17 53.0	0.5	1.9	0.13	22	13 1.5	11 13 36.14	5 52 12.4	0.5	1.9	0.13
8	16 3.5	11 18 44.97	5 18 16.0	0.5	1.9	0.13	23	12 57.4	11 13 26.76	5 53 12.3	0.5	1.9	0.13
9	15 59.5	11 18 41.57	5 18 40.2	0.5	1.9	0.13	24	12 53.3	11 13 17.32	5 54 12.4	0.5	1.9	0.13
10	15 55.6	11 18 37.98	+ 5 19 5.5	0.5	1.9	0.13	25	12 49.2	11 13 7.85	+ 5 55 12.9	0.5	1.9	0.13
11	15 51.6	11 18 34.20	5 19 32.1	0.5	1.9	0.13	26	12 45.1	11 12 58.34	5 56 13.5	0.5	1.9	0.13
12	15 47.6	11 18 30.22	5 19 59.9	0.5	1.9	0.13	27	12 41.0	11 12 48.78	5 57 14.2	0.5	1.9	0.13
13	15 43.6	11 18 26.06	5 20 28.8	0.5	1.9	0.13	28	12 36.9	11 12 39.18	5 58 15.1	0.5	1.9	0.13
14	15 39.6	11 18 21.72	5 20 58.8	0.5	1.9	0.13	Mar. 1	12 32.9	11 12 29.57	5 59 16.1	0.5	1.9	0.13
15	15 35.5	11 18 17.19	+ 5 21 30.0	0.5	1.9	0.13	2	12 28.8	11 12 19.94	+ 6 0 17.2	0.5	1.9	0.13
16	15 31.5	11 18 12.47	5 22 2.4	0.5	1.9	0.13	3	12 24.7	11 12 10.28	6 1 18.3	0.5	1.9	0.13
17	15 27.5	11 18 7.58	5 22 35.8	0.5	1.9	0.13	4	12 20.6	11 12 0.61	6 2 19.4	0.5	1.9	0.13
18	15 23.5	11 18 2.51	5 23 10.3	0.5	1.9	0.13	5	12 16.5	11 11 50.92	6 3 20.6	0.5	1.9	0.13
19	15 19.5	11 17 57.26	5 23 45.9	0.5	1.9	0.13	6	12 12.4	11 11 41.23	6 4 21.7	0.5	1.9	0.13
20	15 15.5	11 17 51.84	+ 5 24 22.6	0.5	1.9	0.13	7	12 8.3	11 11 31.54	+ 6 5 22.8	0.5	1.9	0.13
21	15 11.4	11 17 46.25	5 25 0.3	0.5	1.9	0.13	8	12 4.2	11 11 21.85	6 6 23.8	0.5	1.9	0.13
22	15 7.4	11 17 40.50	5 25 39.0	0.5	1.9	0.13	9	12 0.1	11 11 12.16	6 7 24.7	0.5	1.9	0.13
23	15 3.4	11 17 34.58	5 26 18.7	0.5	1.9	0.13	10	11 56.0	11 11 2.48	6 8 25.4	0.5	1.9	0.13
24	14 59.4	11 17 28.49	5 26 59.5	0.5	1.9	0.13	11	11 51.9	11 10 52.82	6 9 26.0	0.5	1.9	0.13
25	14 55.3	11 17 22.25	+ 5 27 41.1	0.5	1.9	0.13	12	11 47.8	11 10 43.18	+ 6 10 26.4	0.5	1.9	0.13
26	14 51.3	11 17 15.86	5 28 23.7	0.5	1.9	0.13	13	11 43.7	11 10 33.56	6 11 26.6	0.5	1.9	0.13
27	14 47.2	11 17 9.31	5 29 7.2	0.5	1.9	0.13	14	11 39.6	11 10 23.96	6 12 26.6	0.5	1.9	0.13
28	14 43.2	11 17 2.61	5 29 51.7	0.5	1.9	0.13	15	11 35.5	11 10 14.40	6 13 26.3	0.5	1.9	0.13
29	14 39.2	11 16 55.77	5 30 37.1	0.5	1.9	0.13	16	11 31.4	11 10 4.87	6 14 25.7	0.5	1.9	0.13
30	14 35.1	11 16 48.78	+ 5 31 23.2	0.5	1.9	0.13	17	11 27.4	11 9 55.38	+ 6 15 24.8	0.5	1.9	0.13
31	14 31.1	11 16 41.65	5 32 10.2	0.5	1.9	0.13	18	11 23.3	11 9 45.93	6 16 23.6	0.5	1.9	0.13
Feb. 1	14 27.0	11 16 34.38	5 32 58.1	0.5	1.9	0.13	19	11 19.2	11 9 36.54	6 17 22.0	0.5	1.9	0.13
2	14 22.9	11 16 26.98	5 33 46.7	0.5	1.9	0.13	20	11 15.1	11 9 27.20	6 18 20.0	0.5	1.9	0.13
3	14 18.9	11 16 19.45	5 34 36.1	0.5	1.9	0.13	21	11 11.0	11 9 17.90	6 19 17.6	0.5	1.9	0.13
4	14 14.8	11 16 11.79	+ 5 35 26.3	0.5	1.9	0.13	22	11 6.9	11 9 8.68	+ 6 20 14.7	0.5	1.9	0.13
5	14 10.8	11 16 4.01	5 36 17.3	0.5	1.9	0.13	23	11 2.8	11 8 59.53	6 21 11.3	0.5	1.9	0.13
6	14 6.7	11 15 56.10	5 37 8.9	0.5	1.9	0.13	24	10 58.8	11 8 50.44	6 22 7.4	0.5	1.9	0.13
7	14 2.6	11 15 48.08	5 38 1.2	0.5	1.9	0.13	25	10 54.7	11 8 41.41	6 23 3.0	0.5	1.9	0.13
8	13 58.6	11 15 39.95	5 38 54.2	0.5	1.9	0.13	26	10 50.6	11 8 32.48	6 23 58.0	0.5	1.9	0.13
9	13 54.5	11 15 31.70	+ 5 39 47.9	0.5	1.9	0.13	27	10 46.5	11 8 23.63	+ 6 24 52.4	0.5	1.9	0.13
10	13 50.4	11 15 23.35	5 40 42.2	0.5	1.9	0.13	28	10 42.4	11 8 14.86	6 25 46.2	0.5	1.9	0.13
11	13 46.4	11 15 14.89	5 41 37.0	0.5	1.9	0.13	29	10 38.4	11 8 6.17	6 26 39.5	0.5	1.9	0.13
12	13 42.3	11 15 6.33	5 42 32.4	0.5	1.9	0.13	30	10 34.3	11 7 57.58	6 27 32.1	0.5	1.9	0.13
13	13 38.2	11 14 57.67	5 43 28.4	0.5	1.9	0.13	31	10 30.2	11 7 49.09	6 28 24.0	0.5	1.9	0.13
14	13 34.1	11 14 48.93	+ 5 44 25.0	0.5	1.9	0.13	32	10 26.2	11 7 40.70	+ 6 29 15.2	0.5	1.9	0.13
15	13 30.1	11 14 40.10	+ 5 45 22.0	0.5	1.9	0.13	33	10 22.1	11 7 32.41	+ 6 30 5.8	0.5	1.9	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	10 26.2	11 7 40.70	+ 6 29 15.2	0.5	1.9	0 13	May 17	7 21.5	11 3 50.97	+ 6 51 29.0	0.5	1.9	0.12
2	10 22.1	11 7 32.41	6 30 5.8	0.5	1.9	0.13	18	7 17.5	11 3 50.15	6 51 31.4	0.5	1.9	0.12
3	10 18.0	11 7 24.22	6 30 55.7	0.5	1.9	0.13	19	7 13.6	11 3 49.53	6 51 32.5	0.5	1.9	0.12
4	10 13.9	11 7 16.15	6 31 44.8	0.5	1.9	0.13	20	7 9.6	11 3 49.10	6 51 32.3	0.5	1.9	0.12
5	10 9.9	11 7 8.19	6 32 33.1	0.5	1.9	0.13	21	7 5.7	11 3 48.88	6 51 31.0	0.5	1.9	0.12
6	10 5.8	11 7 0.34	+ 6 33 20.7	0.5	1.9	0.13	22	7 1.8	11 3 48.85	+ 6 51 28.3	0.5	1.9	0.12
7	10 1.8	11 6 52.60	6 34 7.5	0.5	1.9	0.13	23	6 57.8	11 3 49.02	6 51 24.5	0.5	1.9	0.12
8	9 57.7	11 6 44.99	6 34 53.5	0.5	1.9	0.13	24	6 53 9	11 3 49.38	6 51 19.3	0.5	1.9	0.12
9	9 53.7	11 6 37.51	6 35 38 6	0.5	1.9	0.13	25	6 50.0	11 3 49.95	6 51 13.0	0.5	1.8	0.12
10	9 49.6	11 6 30.15	6 36 22.9	0.5	1.9	0.13	26	6 46.1	11 3 50.72	6 51 5 4	0.5	1.8	0.12
11	9 45.6	11 6 22.92	+ 6 37 6.3	0.5	1.9	0.13	27	6 42.2	11 3 51.68	+ 6 50 56.6	0.5	1.8	0.12
12	9 41.5	11 6 15.83	6 37 48.8	0.5	1.9	0.13	28	6 38.2	11 3 52.84	6 50 46.5	0.5	1.8	0.12
13	9 37.5	11 6 8.88	6 38 30.4	0.5	1.9	0.13	29	6 34.3	11 3 54.20	6 50 35.2	0.5	1.8	0.12
14	9 33.4	11 6 2.07	6 39 11.1	0.5	1.9	0.13	30	6 30.4	11 3 55.76	6 50 22.7	0.5	1.8	0.12
15	9 29.4	11 5 55.40	6 39 50.8	0.5	1.9	0.13	31	6 26.5	11 3 57.51	+ 6 50 9.0	0.5	1.8	0.12
16	9 25.3	11 5 48.88	+ 6 40 29.5	0.5	1.9	0.13	Dec. 1	18 50.7	11 35 37.17	+ 3 27 51.5	0.5	1.8	0.12
17	9 21.3	11 5 42.51	6 41 7.3	0.5	1.9	0.13	2	18 46.9	11 35 42.52	3 27 19.6	0.5	1.8	0.12
18	9 17.3	11 5 36.29	6 41 44.1	0.5	1.9	0.13	3	18 43.0	11 35 47.07	3 26 48.9	0.5	1.8	0.12
19	9 13.2	11 5 30.22	6 42 19.9	0.5	1.9	0.13	4	18 39.2	11 35 52.63	3 26 19.6	0.5	1.8	0.12
20	9 9.2	11 5 24.31	6 42 54.6	0.5	1.9	0.13	5	18 35.3	11 35 57.40	3 25 51.5	0.5	1.8	0.12
21	9 5.2	11 5 18.57	+ 6 43 28.3	0.5	1.9	0.13	6	18 31.5	11 36 1.97	+ 3 25 24.7	0.5	1.8	0.12
22	9 1.2	11 5 12.99	6 44 1.0	0.5	1.9	0.13	7	18 27.6	11 36 6.34	3 24 59.2	0.5	1.8	0.12
23	8 57.1	11 5 7.57	6 44 32.6	0.5	1.9	0.13	8	18 23.7	11 36 10.51	3 24 35.1	0.5	1.8	0.12
24	8 53.1	11 5 2.32	6 45 3.1	0.5	1.9	0.13	9	18 19.9	11 36 14.48	3 24 12.2	0.5	1.8	0.12
25	8 49.1	11 4 57.23	6 45 32.5	0.5	1.9	0.13	10	18 16.0	11 36 18.24	3 23 50.6	0.5	1.8	0.12
26	8 45.1	11 4 52.32	+ 6 46 0.9	0.5	1.9	0.13	11	18 12.1	11 36 21.80	+ 3 23 30.4	0.5	1.8	0.12
27	8 41.1	11 4 47.57	6 46 28.1	0.5	1.9	0.13	12	18 8.3	11 36 25.16	3 23 11.5	0.5	1.8	0.12
28	8 37.1	11 4 43.00	6 46 54.2	0.5	1.9	0.13	13	18 4.4	11 36 28.31	3 22 53.9	0.5	1.8	0.12
29	8 33.0	11 4 38.60	6 47 19.2	0.5	1.9	0.13	14	18 0.5	11 36 31.25	3 22 37.6	0.5	1.8	0.12
30	8 29.0	11 4 34.38	6 47 43.1	0.5	1.9	0.13	15	17 56.6	11 36 33.99	3 22 22.7	0.5	1.8	0.12
May 1	8 25.0	11 4 30.34	+ 6 48 5.9	0.5	1.9	0.13	16	17 52.7	11 36 36.52	+ 3 22 9.1	0.5	1.8	0.12
2	8 21.0	11 4 26.48	6 48 27.5	0.5	1.9	0.13	17	17 48.8	11 36 38.85	3 21 56.8	0.5	1.8	0.12
3	8 17.0	11 4 22.80	6 48 47.9	0.5	1.9	0.13	18	17 44.9	11 36 40.97	3 21 45.9	0.5	1.8	0.12
4	8 13.1	11 4 19.30	6 49 7.2	0.5	1.9	0.13	19	17 41.0	11 36 42.88	3 21 36.3	0.5	1.8	0.12
5	8 9.1	11 4 15.99	6 49 25.3	0.5	1.9	0.13	20	17 37.1	11 36 44.59	3 21 28.0	0.5	1.8	0.12
6	8 5.1	11 4 12.86	+ 6 49 42.2	0.5	1.9	0.13	21	17 33.2	11 36 46.09	+ 3 21 21.1	0.5	1 8	0.12
7	8 1.1	11 4 9.91	6 49 58.0	0.5	1.9	0.13	22	17 29.3	11 36 47.38	3 21 15.5	0.5	1.8	0.12
8	7 57.1	11 4 7.16	6 50 12.5	0.5	1.9	0.13	23	17 25.4	11 36 48.47	3 21 11.2	0.5	1.8	0.12
9	7 53.2	11 4 4.59	6 50 25.9	0.5	1.9	0.13	24	17 21.5	11 36 49.35	3 21 8 3	0.5	1.8	0.12
10	7 49.2	11 4 2.21	6 50 38.1	0.5	1.9	0.13	25	17 17.6	11 36 50.02	3 21 6.8	0.5	1.8	0.12
11	7 45.2	11 4 0.02	+ 6 50 49.0	0.5	1.9	0.13	26	17 13.7	11 36 50.49	+ 3 21 6.5	0.5	1.8	0.12
12	7 41.3	11 3 58.03	6 50 58.8	0.5	1.9	0.13	27	17 9.7	11 36 50.75	3 21 7.6	0.5	1.8	0.12
13	7 37.3	11 3 56.23	6 51 7.3	0.5	1.9	0.13	28	17 5.8	11 36 50.80	3 21 10.0	0.5	1.9	0.12
14	7 33.3	11 3 54.62	6 51 14.5	0.5	1.9	0.13	29	17 1.9	11 36 50.64	3 21 13.8	0.5	1.9	0.12
15	7 29.4	11 3 53.21	6 51 20.6	0.5	1.9	0.13	30	16 57.9	11 36 50.28	3 21 18.9	0.5	1.9	0.12
16	7 25.4	11 3 51.99	+ 6 51 25.5	0.5	1.9	0.13	31	16 54.0	11 36 49.71	+ 3 21 25.3	0.5	1.9	0.12
17	7 21.5	11 3 50.97	+ 6 51 29.0	0.5	1.9	0.12	32	16 50.0	11 36 48.93	+ 3 21 33.0	0.5	1.9	0.12

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	8 5.7	2 48 3.53	+14 18 0.4	0.3	1.3	0.09	Feb. 15	5 4.8	2 48 1.84	+14 20 49.0	0.3	1.3	0.09
1	8 1.7	2 48 0.55	14 17 50.4	0.3	1.3	0.09	16	5 0.9	2 48 4.95	14 21 6.8	0.3	1.3	0.09
2	7 57.7	2 47 57.68	14 17 40.9	0.3	1.3	0.09	17	4 57.1	2 48 8.19	14 21 25.1	0.3	1.3	0.09
3	7 53.8	2 47 54.94	14 17 32.1	0.3	1.3	0.09	18	4 53.2	2 48 11.56	14 21 44.0	0.3	1.3	0.09
4	7 49.8	2 47 52.32	14 17 23.9	0.3	1.3	0.09	19	4 49.3	2 48 15.06	14 22 3.5	0.3	1.3	0.09
5	7 45.8	2 47 49.82	+14 17 16.3	0.3	1.3	0.09	20	4 45.4	2 48 18.68	+14 22 23.5	0.3	1.3	0.09
6	7 41.8	2 47 47.45	14 17 9.2	0.3	1.3	0.09	21	4 41.5	2 48 22.42	14 22 44.0	0.3	1.3	0.09
7	7 37.9	2 47 45.20	14 17 2.7	0.3	1.3	0.09	22	4 37.7	2 48 26.29	14 23 5.0	0.3	1.3	0.09
8	7 33.9	2 47 43.08	14 16 56.8	0.3	1.3	0.09	23	4 33.9	2 48 30.27	14 23 26.5	0.3	1.3	0.09
9	7 29.9	2 47 41.09	14 16 51.6	0.3	1.3	0.09	24	4 30.1	2 48 34.42	14 23 48.5	0.3	1.3	0.09
10	7 26.0	2 47 39.23	+14 16 47.0	0.3	1.3	0.09	25	4 26.1	2 48 38.65	+14 24 11.1	0.3	1.3	0.09
11	7 22.0	2 47 37.50	14 16 42.9	0.3	1.3	0.09	26	4 22.2	2 48 43.01	14 24 34.2	0.3	1.3	0.09
12	7 18.1	2 47 35.90	14 16 39.5	0.3	1.3	0.09	27	4 18.3	2 48 47.49	14 24 57.8	0.3	1.3	0.09
13	7 14.1	2 47 34.43	14 16 36.7	0.3	1.3	0.09	28	4 14.4	2 48 52.08	+14 25 21.8	0.3	1.3	0.09
14	7 10.1	2 47 33.09	14 16 34.5	0.3	1.3	0.09							
15	7 6.2	2 47 31.89	+14 16 32.9	0.3	1.3	0.09							
16	7 2.2	2 47 30.82	14 16 31.9	0.3	1.3	0.09	Sept. 1	16 25.7	3 7 26.45	+15 42 14.6	0.3	1.3	0.09
17	6 58.3	2 47 29.89	14 16 31.5	0.3	1.3	0.09	2	16 21.7	3 7 25.01	15 42 5.2	0.3	1.3	0.09
18	6 54.3	2 47 29.09	14 16 31.7	0.3	1.3	0.09	3	16 17.8	3 7 23.44	15 41 55.3	0.3	1.3	0.09
19	6 50.4	2 47 28.42	14 16 32.6	0.3	1.3	0.09	4	16 13.8	3 7 21.75	15 41 45.0	0.3	1.3	0.09
20	6 46.5	2 47 27.89	+14 16 34.1	0.3	1.3	0.09	5	16 9.8	3 7 19.93	+15 41 34.2	0.3	1.3	0.09
21	6 42.5	2 47 27.50	14 16 36.2	0.3	1.3	0.09	6	16 5.9	3 7 17.98	15 41 22.8	0.3	1.3	0.09
22	6 38.6	2 47 27.24	14 16 38.9	0.3	1.3	0.09	7	16 1.9	3 7 15.90	15 41 10.9	0.3	1.3	0.09
23	6 34.6	2 47 27.12	14 16 42.3	0.3	1.3	0.09	8	15 57.9	3 7 13.70	15 40 58.5	0.3	1.3	0.09
24	6 30.7	2 47 27.14	14 16 46.3	0.3	1.3	0.09	9	15 54.0	3 7 11.38	15 40 45.7	0.3	1.3	0.09
25	6 26.8	2 47 27.29	+14 16 50.9	0.3	1.3	0.09	10	15 50.0	3 7 8.94	+15 40 32.4	0.3	1.3	0.09
26	6 22.8	2 47 27.58	14 16 56.1	0.3	1.3	0.09	11	15 46.0	3 7 6.38	15 40 18.7	0.3	1.3	0.09
27	6 18.9	2 47 28.00	14 17 2.0	0.3	1.3	0.09	12	15 42.1	3 7 3.69	15 40 4.5	0.3	1.3	0.09
28	6 15.0	2 47 28.56	14 17 8.5	0.3	1.3	0.09	13	15 38.1	3 7 0.88	15 39 49.8	0.3	1.3	0.09
29	6 11.1	2 47 29.26	14 17 15.6	0.3	1.3	0.09	14	15 34.1	3 6 57.95	15 39 34.7	0.3	1.3	0.09
30	6 7.2	2 47 30.09	+14 17 23.3	0.3	1.3	0.09	15	15 30.1	3 6 54.91	+15 39 19.1	0.3	1.3	0.09
31	6 3.2	2 47 31.06	14 17 31.7	0.3	1.3	0.09	16	15 26.1	3 6 51.75	15 39 3.0	0.3	1.3	0.09
Feb. 1	5 59.4	2 47 32.17	14 17 40.7	0.3	1.3	0.09	17	15 22.1	3 6 48.48	15 38 46.5	0.3	1.3	0.09
2	5 55.5	2 47 33.42	14 17 50.2	0.3	1.3	0.09	18	15 18 2	3 6 45.09	15 38 29.6	0.3	1.3	0.09
3	5 51.6	2 47 34.80	14 18 0.4	0.3	1.3	0.09	19	15 14.2	3 6 41.58	15 38 12.3	0.3	1.3	0.09
4	5 47.7	2 47 36.32	+14 18 11.2	0.3	1.3	0.09	20	15 10.2	3 6 37.96	+15 37 54.5	0.3	1.3	0.09
5	5 43.8	2 47 37.97	14 18 22.6	0.3	1.3	0.09	21	15 6.2	3 6 34.23	15 37 36.3	0.3	1.3	0.09
6	5 39.9	2 47 39.76	14 18 34.6	0.3	1.3	0.09	22	15 2.2	3 6 30.39	15 37 17.7	0.3	1.3	0.09
7	5 36.0	2 47 41.68	14 18 47.2	0.3	1.3	0.09	23	14 58.2	3 6 26.44	15 36 58.7	0.3	1.3	0.09
8	5 32.1	2 47 43.74	14 19 0.3	0.3	1.3	0.09	24	14 54.2	3 6 22.39	15 36 39.3	0.3	1.3	0.09
9	5 28.1	2 47 45.93	+14 19 14.0	0.3	1.3	0.09	25	14 50.2	3 6 18.24	+15 36 19.5	0.3	1.3	0.09
10	5 24.2	2 47 48.25	14 19 28.3	0.3	1.3	0.09	26	14 46.2	3 6 13.99	15 35 59.3	0.3	1.3	0.09
11	5 20.3	2 47 50.71	14 19 43.3	0.3	1.3	0.09	27	14 42.2	3 6 9.63	15 35 38.7	0.3	1.3	0.09
12	5 16.4	2 47 53.30	14 19 58.9	0.3	1.3	0.09	28	14 38.2	3 6 5.18	15 35 17.8	0.3	1.3	0.09
13	5 12.6	2 47 56.02	14 20 15.0	0.3	1.3	0.09	29	14 34.2	3 6 0.64	15 34 56.6	0.3	1.3	0.09
14	5 8.7	2 47 58.86	+14 20 31.7	0.3	1.3	0.09	30	14 30.2	3 5 56.00	+15 34 35.0	0.3	1.3	0.09
15	5 4.8	2 48 1.84	+14 20 49.0	0.3	1.3	0.09	31	14 26.2	3 5 51.25	+15 34 13.0	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Som. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	14 26.2	3 5 51.25	+15 34 13.0	0.3	1.3	0.09	Nov. 16	11 20.6	3 1 8.13	+15 13 46.9	0.3	1.3	0.09
2	14 22.2	3 5 46.41	15 33 50.7	0.3	1.3	0.09	17	11 16.6	3 1 1.49	15 13 19.5	0.3	1.3	0.09
3	14 18.1	3 5 41.49	15 33 28.1	0.3	1.3	0.09	18	11 12.5	3 0 54.87	15 12 52.2	0.3	1.3	0.09
4	14 14.1	3 5 36.47	15 33 5.1	0.3	1.3	0.09	19	11 8.5	3 0 48.27	15 12 25.1	0.3	1.3	0.09
5	14 10.1	3 5 31.36	15 32 41.7	0.3	1.3	0.09	20	11 4.4	3 0 41.71	15 11 58.2	0.3	1.3	0.09
6	14 6.1	3 5 26.17	+15 32 18.1	0.3	1.3	0.09	21	11 0.4	3 0 35.18	+15 11 31.5	0.3	1.3	0.09
7	14 2.1	3 5 20.90	15 31 54.2	0.3	1.3	0.09	22	10 56.4	3 0 28.67	15 11 4.9	0.3	1.3	0.09
8	13 58.1	3 5 15.55	15 31 30.1	0.3	1.3	0.09	23	10 52.3	3 0 22.19	15 10 38.5	0.3	1.3	0.09
9	13 54.0	3 5 10.12	15 31 5.6	0.3	1.3	0.09	24	10 48.3	3 0 15.75	15 10 12.4	0.3	1.3	0.09
10	13 50.0	3 5 4.61	15 30 40.8	0.3	1.3	0.09	25	10 44.2	3 0 9.36	15 9 46.5	0.3	1.3	0.09
11	13 46.0	3 4 59.03	+15 30 15.8	0.3	1.3	0.09	26	10 40.2	3 0 3.01	+15 9 20.9	0.3	1.3	0.09
12	13 42.0	3 4 53.38	15 29 50.5	0.3	1.3	0.09	27	10 36.2	2 59 56.70	15 8 55.5	0.3	1.3	0.09
13	13 37.9	3 4 47.65	15 29 25.0	0.3	1.3	0.09	28	10 32.1	2 59 50.44	15 8 30.3	0.3	1.3	0.09
14	13 33.9	3 4 41.86	15 28 59.3	0.3	1.3	0.09	29	10 28.1	2 59 44.23	15 8 5.4	0.3	1.3	0.09
15	13 29.9	3 4 36.00	15 28 33.3	0.3	1.3	0.09	30	10 24.1	2 59 38.08	15 7 40.8	0.3	1.3	0.09
16	13 25.9	3 4 30.07	+15 28 7.1	0.3	1.3	0.09	Dec. 1	10 20.0	2 59 31.98	+15 7 16.6	0.3	1.3	0.09
17	13 21.8	3 4 24.08	15 27 40.7	0.3	1.3	0.09	2	10 16.0	2 59 25.94	15 6 52.6	0.3	1.3	0.09
18	13 17.8	3 4 18.04	15 27 14.1	0.3	1.3	0.09	3	10 12.0	2 59 19.95	15 6 28.9	0.3	1.3	0.09
19	13 13.8	3 4 11.94	15 26 47.3	0.3	1.3	0.09	4	10 7.9	2 59 14.03	15 6 5.5	0.3	1.3	0.09
20	13 9.7	3 4 5.78	15 26 20.4	0.3	1.3	0.09	5	10 3.9	2 59 8.17	15 5 42.5	0.3	1.3	0.09
21	13 5.7	3 3 59.57	+15 25 53.3	0.3	1.3	0.09	6	9 59.9	2 59 2.38	+15 5 19.8	0.3	1.3	0.09
22	13 1.7	3 3 53.31	15 25 26.1	0.3	1.3	0.09	7	9 55.8	2 58 56.66	15 4 57.5	0.3	1.3	0.09
23	12 57.6	3 3 47.00	15 24 58.7	0.3	1.3	0.09	8	9 51.8	2 58 51.01	15 4 35.5	0.3	1.3	0.09
24	12 53.6	3 3 40.65	15 24 31.2	0.3	1.3	0.09	9	9 47.8	2 58 45.44	15 4 13.9	0.3	1.3	0.09
25	12 49.5	3 3 34.25	15 24 3.5	0.3	1.3	0.09	10	9 43.8	2 58 39.95	15 3 52.7	0.3	1.3	0.09
26	12 45.5	3 3 27.82	+15 23 35.7	0.3	1.3	0.09	11	9 39.7	2 58 34.53	+15 3 31.8	0.3	1.3	0.09
27	12 41.5	3 3 21.35	15 23 7.8	0.3	1.3	0.09	12	9 35.7	2 58 29.19	15 3 11.4	0.3	1.3	0.09
28	12 37.4	3 3 14.84	15 22 39.9	0.3	1.3	0.09	13	9 31.7	2 58 23.94	15 2 51.4	0.3	1.3	0.09
29	12 33.4	3 3 8.30	15 22 11.9	0.3	1.3	0.09	14	9 27.7	2 58 18.78	15 2 31.8	0.3	1.3	0.09
30	12 29.3	3 3 1.74	15 21 43.8	0.3	1.3	0.09	15	9 23.7	2 58 13 70	15 2 12.6	0.3	1.3	0.09
31	12 25.3	3 2 55.15	+15 21 15.6	0.3	1.3	0.09	16	9 19.7	2 58 8.71	+15 1 53.8	0.3	1.3	0 09
Nov. 1	12 21.3	3 2 48.54	15 20 47.4	0.3	1.3	0.09	17	9 15.6	2 58 3.81	15 1 35.4	0.3	1.3	0.09
2	12 17.2	3 2 41.90	15 20 19.2	0.3	1.3	0.09	18	9 11.6	2 57 59.01	15 1 17.5	0.3	1.3	0.09
3	12 13.2	3 2 35.24	15 19 51.0	0.3	1.3	0.09	19	9 7.6	2 57 54.31	15 1 0.1	0.3	1.3	0.09
4	12 9.1	3 2 28.56	15 19 22.8	0.3	1.3	0.09	20	9 3.6	2 57 49.70	15 0 43.1	0.3	1.3	0.09
5	12 5.1	3 2 21.87	+15 18 54.6	0.3	1.3	0.09	21	8 59.6	2 57 45.19	+15 0 26.6	0.3	1.3	0.09
6	12 1.0	3 2 15.17	15 18 26.3	0.3	1.3	0.09	22	8 55.6	2 57 40.78	15 0 10.6	0.3	1.3	0.09
7	11 57.0	3 2 8.46	15 17 58.1	0.3	1.3	0.09	23	8 51.6	2 57 36.47	14 59 55.0	0.3	1.3	0.09
8	11 53.0	3 2 1.75	15 17 29.9	0.3	1.3	0.09	24	8 47.6	2 57 32.27	14 59 39.9	0.3	1.3	0.09
9	11 48.9	3 1 55.03	15 17 1.8	0.3	1.3	0.09	25	8 43.6	2 57 28.18	14 59 25.3	0.3	1.3	0.09
10	11 44.9	3 1 48.31	+15 16 33.7	0.3	1.3	0.09	26	8 39.6	2 57 24.20	+14 59 11.3	0.3	1.3	0.09
11	11 40.8	3 1 41.59	15 16 5.6	0.3	1.3	0.09	27	8 35.6	2 57 20.32	14 58 57.8	0.3	1.3	0.09
12	11 36.8	3 1 34.88	15 15 37.6	0.3	1.3	0.09	28	8 31.6	2 57 16.55	14 58 44.8	0.3	1.3	0.09
13	11 32.7	3 1 28.17	15 15 9.7	0.3	1.3	0.09	29	8 27.6	2 57 12.90	14 58 32.4	0.3	1.3	0.09
14	11 28.7	3 1 21.47	15 14 42.0	0.3	1.3	0.09	30	8 23.6	2 57 9.36	14 58 20.5	0.3	1.3	0.09
15	11 24.6	3 1 14.79	+15 14 14.4	0.3	1.3	0.09	31	8 19.6	2 57 5.94	+14 58 9.1	0.3	1.3	0.09
16	11 20.6	3 1 8.13	+15 13 46.9	0.3	1.3	0.09	32	8 15.6	2 57 2.65	+14 57 58.3	0.3	1.3	0.09

PHENOMENA

ECLIPSES IN 1882.

In the year 1882 there will be two Eclipses, both of the Sun; and a Transit of the planet Venus over the disk of the Sun.

I.—A Total Eclipse of the Sun, 1882, May 16, invisible at Washington.

Elements of the Eclipse.

Greenwich mean time of ☌ in Right Ascension, May $16^{d}\ 19^{h}\ 41^{m}\ 31^{s}.9$.

Sun's and Moon's R. A.	$3^{h}\ 35^{m}\ 46^{s}.77$	Hourly Motions	$9^{s}.92$ and $144^{s}.91$
Sun's Declination	$19^{\circ}\ 19'\ 39''.9$ N.	Hourly Motion	$0'\ 33''.8$
Moon's Declination	19 38 52.0 N.	Hourly Motion	4 57.8
Sun's Equa. Hor. Par.	8.7	True Semidiameter	15 50.8
Moon's Equa. Hor. Par.	58 16.3	True Semidiameter	15 51.9

Principal Circumstances of the Eclipse.

		d h m		° ′		° ′
Eclipse begins	May	16 16 52.5	in long.	15 30.1 E.	and in lat.	4 3.5 N.
Central Eclipse begins		16 17 54.0		3 12.6 W.		10 37.9 N.
Central Eclipse at Noon		16 19 41.5		63 39.4 E.		38 38.6 N.
Central Eclipse ends		16 21 19.3		138 52.2 E.		25 31.0 N.
Eclipse ends		16 22 20.8		120 48.5 E.		19 0.4 N.

II.—An Annular Eclipse of the Sun, 1882, November 10, invisible at Washington.

Elements of the Eclipse.

Greenwich mean time of ☌ in Right Ascension, November $10^{d}\ 11^{h}\ 26^{m}\ 21^{s}.8$.

Sun's and Moon's R. A.	$15^{h}\ 4^{m}\ 9^{s}.53$	Hourly Motions	$10^{s}.14$ and $128^{s}.15$
Sun's Declination	$17^{\circ}\ 20'\ 33''.7$ S.	Hourly Motion	$0'\ 41''.7$
Moon's Declination	17 32 7.2 S.	Hourly Motion	5 48.0
Sun's Equa. Hor. Par.	8.9	True Semidiameter	16 12.1
Moon's Equa. Hor. Par.	55 17.8	True Semidiameter	15 3.3

Principal Circumstances of the Eclipse.

		d h m		° ′		° ′
Eclipse begins	Nov.	10 8 22.3	in long.	141 16.0 E.	and in lat.	2 38.8 N.
Central Eclipse begins		10 9 28.8		123 19.6 E.		1 33.6 S.
Central Eclipse at Noon		10 11 26.4		175 33.8 W.		29 27.0 S.
Central Eclipse ends		10 13 15.1		105 45.5 W.		21 17.2 S.
Eclipse ends		10 14 21.6		123 51.9 W.		17 4.3 S.

The regions within which these eclipses are visible are laid down on the accompanying maps, from which may also be found the approximate Greenwich time of beginning or ending at any place by following the directions given in the article *On the Arrangement and Use of the American Ephemeris and Nautical Almanac*, page 498.

The times and circumstances of each eclipse may be accurately computed from the elements in the following tables:—

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, 1882, MAY 16.

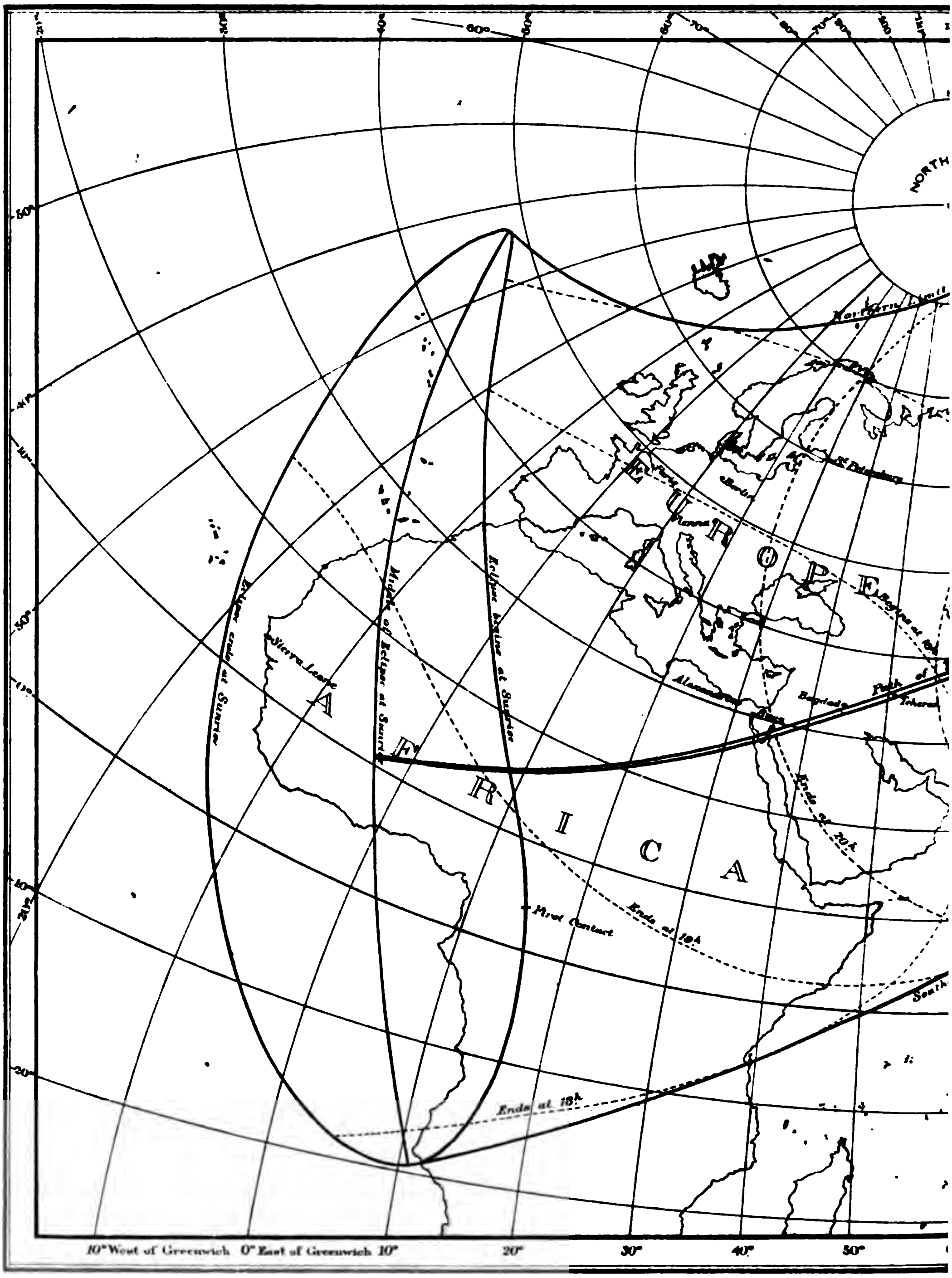
Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Sin *d*.	Cos *d*.	*μ*	*l*	*l′*
h m					° ′		
16 40	−1.65420	+0.09953	+9.51918	+9.97489	250 57.4	0.54452	−0.00140
16 50	1.56310	0.11232	9.51921	9.97489	253 27.4	0.54455	0.00137
17 0	1.47200	0.12509	9.51924	9.97488	255 57.5	0.54458	0.00134
17 10	1.38089	0.13786	9.51927	9.97488	258 27.5	0.54461	0.00131
17 20	1.28978	0.15062	9.51930	9.97487	260 57.5	0.54464	0.00128
17 30	−1.19866	+0.16337	+9.51934	+9.97487	263 27.5	0.54467	−0.00125
17 40	1.10754	0.17612	9.51937	9.97486	265 57.5	0.54470	0.00122
17 50	1.01642	0.18885	9.51940	9.97486	268 27.5	0.54473	0.00120
18 0	0.92530	0.20158	9.51944	9.97485	270 57.5	0.54475	0.00117
18 10	0.83418	0.21430	9.51947	9.97485	273 27.5	0.54478	0.00114
18 20	−0.74305	+0.22701	+9.51950	+9.97484	275 57.6	0.54480	−0.00112
18 30	0.65192	0.23972	9.51954	9.97484	278 27.6	0.54483	0.00110
18 40	0.56079	0.25241	9.51957	9.97484	280 57.6	0.54485	0.00108
18 50	0.46965	0.26510	9.51960	9.97483	283 27.6	0.54487	0.00105
19 0	0.37852	0.27778	9.51964	9.97483	285 57.6	0.54489	0.00103
19 10	−0.28738	+0.29045	+9.51967	+9.97483	288 27.6	0.54491	−0.00101
19 20	0.19624	0.30311	9.51970	9.97482	290 57.6	0.54492	0.00099
19 30	0.10510	0.31577	9.51974	9.97482	293 27.6	0.54494	0.00097
19 40	−0.01396	0.32841	9.51977	9.97481	295 57.6	0.54496	0.00095
19 50	+0.07718	0.34105	9.51980	9.97481	298 27.7	0.54498	0.00093
20 0	+0.16832	+0.35368	+9.51983	+9.97480	300 57.7	0.54500	−0.00091
20 10	0.25946	0.36629	9.51986	9.97480	303 27.7	0.54502	0.00090
20 20	0.35060	0.37890	9.51989	9.97479	305 57.7	0.54503	0.00088
20 30	0.44174	0.39151	9.51993	9.97479	308 27.7	0.54505	0.00087
20 40	0.53288	0.40410	9.51996	9.97479	310 57.7	0.54507	0.00085
20 50	+0.62403	+0.41668	+9.51999	+9.97478	313 27.7	0.54509	−0.00084
21 0	0.71517	0.42926	9.52003	9.97478	315 57.7	0.54510	0.00082
21 10	0.80630	0.44182	9.52006	9.97478	318 27.8	0.54511	0.00081
21 20	0.89744	0.45438	9.52009	9.97477	320 57.8	0.54512	0.00080
21 30	0.98858	0.46693	9.52013	9.97477	323 27.8	0.54513	0.00079
21 40	+1.07972	+0.47947	+9.52016	+9.97476	325 57.8	0.54514	−0.00078
21 50	1.17085	0.49200	9.52019	9.97476	328 27.8	0.54515	0.00077
22 0	1.26198	0.50452	9.52023	9.97475	330 57.8	0.54516	0.00075
22 10	1.35311	0.51703	9.52026	9.97475	333 27.8	0.54517	0.00074
22 20	+1.44424	+0.52953	+9.52029	+9.97474	335 57.8	0.54518	−0.00073

Greenwich Mean Time.	Log Δ *x* for 1 Minute.	Log Δ *y* for 1 Minute.	Log Δ *μ* for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h					
17	+ 7.9595	+ 7.1062	+ 1.1761	7.66485	7.66267
18	7.9596	7.1046	1.1761	7.66485	7.66267
19	7.9597	7.1029	1.1761	7.66484	7.66266
20	7.9597	7.1011	1.1761	7.66484	7.66266
21	7.9597	7.0993	1.1761	7.66484	7.66266
22	+ 7.9597	+ 7.0974	+ 1.1761	7.66483	7.66265

PATH OF SHADOW DURING THE TOTAL ECLIPSE OF THE SUN, 1882, MAY 16.

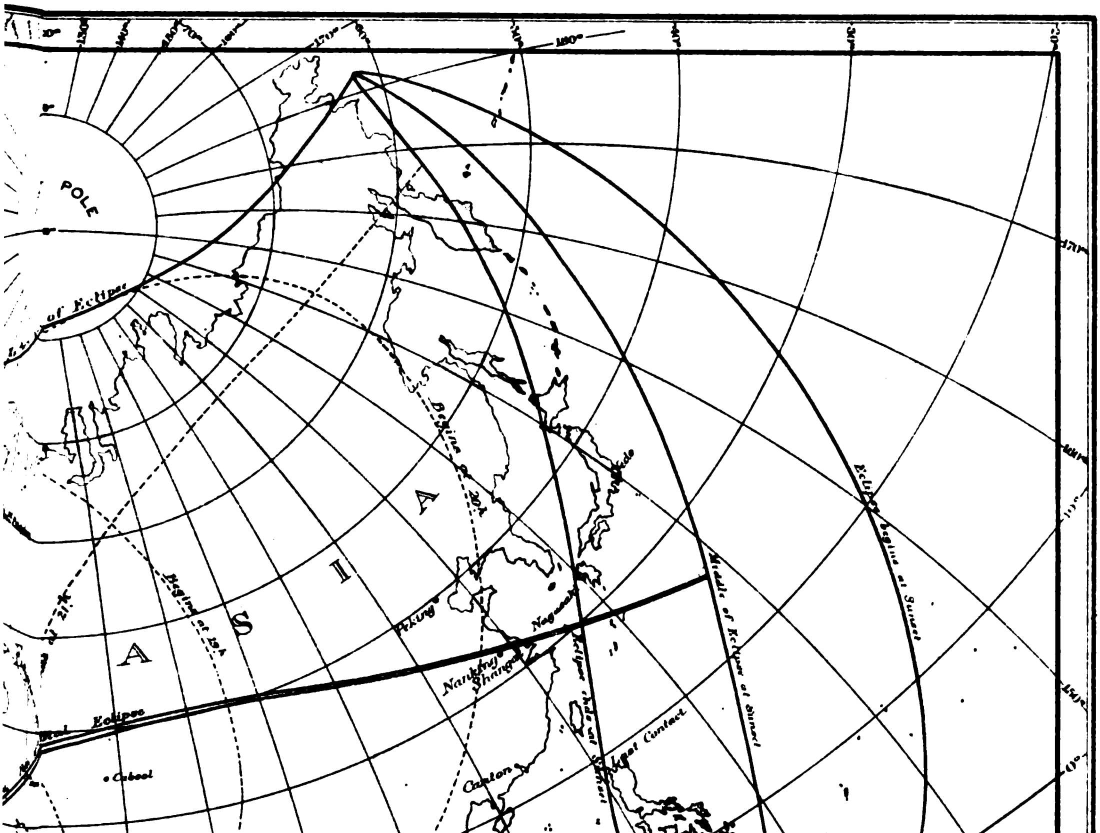
Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits	+10° 39′.8	3° 12′.5 W.	+10° 37′.9	3° 11′.9 W.	+10° 32′.9	3° 9′.9 W.	m s
17^h 55^m	13 22.5	3 46.5 E.	13 22.5	4 9.2 E.	13 22.5	4 31.9 E.	0 28.5
18 0	17 24.4	13 2.9	17 20.5	13 19.5	17 16.6	13 36.1	0 37.4
18 5	19 56.3	18 18.0	19 50.8	18 34.5	19 45.3	18 51.0	0 45.6
18 10	21 58.4	22 19.2	21 51.5	22 35.6	21 44.6	22 52.0	0 53.2
18 15	+23 43.7	25 41.7	+28 35.5	25 57.9	+23 27.3	26 14.1	1 0.0
18 20	25 17.5	28 39.9	25 8.0	28 55.8	24 58.5	29 11.7	1 6.3
18 25	26 42.5	31 21.4	26 31.9	31 37.0	26 21.3	31 52.6	1 12.0
18 30	28 0.6	33 50.8	27 48.9	34 6.1	27 37.2	34 21.4	1 17.1
18 35	29 12.8	36 11.5	29 0.2	36 26.4	28 47.6	36 41.3	1 21.8
18 40	+30 19.9	38 25.8	+30 6.5	38 40.3	+29 53.1	38 54.8	1 26.0
18 45	31 22.5	40 35.0	31 8.4	40 49.1	30 54.3	41 3.2	1 29.8
18 50	32 21.0	42 40.7	32 6.2	42 54.3	31 51.4	43 7.9	1 33.2
18 55	33 15.7	44 43.8	33 0.3	44 56.8	32 44.9	45 9.8	1 36.3
19 0	34 7.0	46 44.9	33 51.0	46 57.3	33 35.0	47 9.7	1 39.1
19 5	+34 54.8	48 45.0	+34 38.3	48 56.7	+34 21.8	49 8.4	1 41.6
19 10	35 39.4	50 44.6	35 22.4	50 55.6	35 5.4	51 6.6	1 43.7
19 15	36 20.8	52 44.1	36 3.4	52 54.3	35 46 0	53 4.5	1 45.4
19 20	36 59.1	54 44.1	36 41.3	54 53.5	36 23.5	55 2.9	1 46.8
19 25	37 34.3	56 44.9	37 16.2	56 53.4	36 58.1	57 1.9	1 47.8
19 30	+38 6.5	58 46.8	+37 48.1	58 54.3	+37 29.7	59 1.8	1 48.3
19 35	38 35.4	60 50.3	38 16.8	60 56.7	37 58.2	61 3.1	1 48.4
19 40	39 1.2	62 55.5	38 42.5	63 0.9	38 23.8	63 6.3	1 48.4
19 45	39 23.8	65 3.0	39 5.1	65 7.2	38 46.4	65 11.4	1 47.9
19 50	39 43.2	67 12.8	39 24.4	67 15.9	39 5.6	67 19.0	1 46.9
19 55	+39 59.2	69 25.3	+39 40.4	69 27.2	+39 21.6	69 29.1	1 45.6
20 0	40 11.7	71 40.9	39 53.0	71 41.5	39 34.3	71 42.1	1 44.0
20 5	40 20.4	73 59.8	40 1.9	73 59.1	39 43.4	73 58.4	1 42.0
20 10	40 25.2	76 22.7	40 7.0	76 20.6	39 48.8	76 18.5	1 39.6
20 15	40 26.0	78 49.4	40 8.2	78 46.0	39 50.4	78 42.6	1 36.8
20 20	+40 22.6	81 21.0	+40 5.2	81 16.3	+39 47.8	81 11.6	1 33.5
20 25	40 14.6	83 57.7	39 57.7	83 51.7	39 40.8	83 45.7	1 29.9
20 30	40 1.6	86 40.6	39 45.3	86 33.3	39 29.0	86 26.0	1 25.9
20 35	39 43.2	89 30.3	39 27.7	89 21.8	39 12.2	89 13.3	1 21.6
20 40	39 18.7	92 28.1	39 4.1	92 18.5	38 49.5	92 8.9	1 16.8
20 45	+38 47.5	95 35.9	+38 33.9	95 25.3	+38 20.3	95 14.7	1 11.7
20 50	38 8.6	98 55.8	37 56.1	98 44.4	37 43.6	98 33.0	1 6.1
20 55	37 20.4	102 31.9	37 9.1	102 19.8	36 57.8	102 7.7	1 0.1
21 0	36 20.6	106 30.0	36 10.6	106 17.1	36 0.6	106 4.2	0 53.8
21 5	35 5.0	110 58.7	34 56.6	110 45.9	34 48.2	110 33.3	0 47.0
21 10	+33 25.7	116 19.2	+33 19.5	116 7.2	+33 13.3	115 55.2	0 39.9
21 15	31 0.8	123 29.5	30 57.8	123 18.5	30 54.8	123 7.5	0 32.4
Limits	+25 31.0	138 51.6 E.	+25 31.0	138 52.2 E.	+25 24.8	138 48.1 E.	

TOTAL ECLIPSE



Note. *The hours of beginning and ending*

IPSE OF MAY 16TH 1882.



are expressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1882, NOVEMBER 10.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Sin *d*.	Cos *d*.	*μ*	*l*	*l'*
h m					° '		
8 30	−1.49917	+0.06335	−9.47352	+9.97988	131 28.3	0.56631	0.02030
8 40	1.41420	0.04781	9.47357	9.97987	133 58.3	0.56630	0.02029
8 50	1.32922	0.03229	9.47361	9.97987	136 28.3	0.56629	0.02028
9 0	1.24424	0.01676	9.47366	9.97986	138 58.3	0.56629	0.02027
9 10	1.15925	+0.00125	9.47370	9.97986	141 28.3	0.56628	0.02026
9 20	−1.07426	−0.01426	−9.47375	+9.97985	143 58.3	0.56627	0.02025
9 30	0.98927	0.02976	9.47379	9.97985	146 28.3	0.56626	0.02024
9 40	0.90427	0.04525	9.47384	9.97984	148 58.3	0.56626	0.02023
9 50	0.81927	0.06074	9.47388	9.97984	151 28.3	0.56625	0.02022
10 0	0.73426	0.07621	9.47393	9.97983	153 58.3	0.56624	0.02021
10 10	−0.64926	−0.09169	−9.47397	+9.97983	156 28.3	0.56623	0.02020
10 20	0.56424	0.10715	9.47402	9.97982	158 58.3	0.56622	0.02018
10 30	0.47923	0.12261	9.47406	9.97982	161 28.3	0.56621	0.02017
10 40	0.39421	0.13806	9.47411	9.97982	163 58.3	0.56620	0.02016
10 50	0.30919	0.15350	9.47416	9.97981	166 28.3	0.56618	0.02015
11 0	−0.22417	−0.16894	−9.47421	+9.97981	168 58.3	0.56617	0.02014
11 10	0.13914	0.18437	9.47425	9.97981	171 28.3	0.56615	0.02012
11 20	−0.05411	0.19979	9.47430	9.97980	173 58.3	0.56614	0.02011
11 30	+0.03092	0.21521	9.47434	9.97980	176 28.3	0.56613	0.02009
11 40	0.11595	0.23062	9.47439	9.97979	178 58.3	0.56611	0.02008
11 50	+0.20099	−0.24603	−9.47444	+9.97979	181 28.3	0.56609	0.02006
12 0	0.28602	0.26142	9.47448	9.97978	183 58.3	0.56607	0.02005
12 10	0.37106	0.27682	9.47453	9.97978	186 28.3	0.56605	0.02003
12 20	0.45610	0.29220	9.47457	9.97977	188 58.3	0.56603	0.02001
12 30	0.54114	0.30758	9.47462	9.97977	191 28.3	0.56602	0.01999
12 40	+0.62618	−0.32296	−9.47466	+9.97976	193 58.3	0.56600	0.01997
12 50	0.71122	0.33833	9.47471	9.97976	196 28.3	0.56598	0.01995
13 0	0.79626	0.35369	9.47476	9.97975	198 58.3	0.56596	0.01993
13 10	0.88131	0.36905	9.47480	9.97975	201 28.3	0.56594	0.01991
13 20	0.96635	0.38440	9.47485	9.97974	203 58.3	0.56592	0.01989
13 30	+1.05139	−0.39974	−9.47489	+9.97974	206 28.3	0.56590	0.01986
13 40	1.13644	0.41508	9.47494	9.97974	208 58.3	0.56587	0.01984
13 50	1.22148	0.43042	9.47499	9.97973	211 28.3	0.56585	0.01982
14 0	1.30653	0.44575	9.47503	9.97973	213 58.3	0.56582	0.01980
14 10	1.39157	0.46107	9.47507	9.97973	216 28.3	0.56579	0.01978
14 20	+1.47661	−0.47639	−9.47512	+9.97972	218 58.3	0.56576	0.01976

Greenwich Mean Time.	Log Δ *x* for 1 Minute.	Log Δ *y* for 1 Minute.	Log Δ *μ* for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h					
9	+ 7.9293	− 7.1909	+ 1.1761	7.67452	7.67234
10	7.9294	7.1896	1.1761	7.67453	7.67235
11	7.9295	7.1885	1.1761	7.67453	7.67235
12	7.9296	7.1874	1.1761	7.67453	7.67235
13	7.9296	7.1864	1.1761	7.67454	7.67236
14	+ 7.9297	− 7.1854	+ 1.1761	7.67454	7.67236

PATH OF ANNULUS DURING THE ANNULAR ECLIPSE OF THE SUN, 1882, NOVEMBER 10.

Greenwich Mean Time.	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits	– 0° 24′.6	123° 14′.9 E.	– 1° 32′.5	123° 21′.1 E.	– 2° 40′.0	123° 44′.0 E.	m s
9h 30m	3 55.9	133 55.2	4 5.8	130 52.8	4 15.7	127 50.4	4 38.4
9 35	6 59.2	141 4.5	7 34.4	139 31.4	8 9.6	137 58.3	4 49.8
9 40	9 10.1	145 41.8	9 49.6	144 26.6	10 29.1	143 11.4	4 59.2
9 45	10 58.2	149 15.6	11 39.5	148 9.7	12 20.8	147 3.8	5 6.8
9 50	–12 32.5	152 13.6	–13 14.9	151 13.7	–13 57.3	150 13.8	5 12.7
9 55	13 57.4	154 48.4	14 40.5	153 52.9	15 23.6	152 57.4	5 18.6
10 0	15 15.1	157 7.0	15 58.8	156 14.9	16 42.5	155 22.8	5 24.1
10 5	16 27.2	159 13.8	17 11.3	158 24.2	17 55.4	157 34.6	5 29.3
10 10	17 34.4	161 11.0	18 18.9	160 23.8	19 3.4	159 36.6	5 34.3
10 15	–18 37.7	163 1.0	–19 22.6	162 16.0	–20 7.5	161 31.0	5 39.0
10 20	19 37.2	164 45.3	20 22.5	164 2.4	21 7.8	163 19.5	5 43.5
10 25	20 33.5	166 25.0	21 19.2	165 44.1	22 4.9	165 3.2	5 47.7
10 30	21 26.8	168 1.1	22 13.0	167 22.2	22 59.2	166 43.3	5 51.6
10 35	22 17.5	169 34.5	23 4.1	168 57.4	23 50.7	168 20.3	5 55.3
10 40	–23 5.6	171 5.8	–23 52.7	170 30.4	–24 39.8	169 55.0	5 58.8
10 45	23 51.3	172 35.5	24 38.8	172 1.7	25 26.3	171 27.9	6 2.1
10 50	24 34.7	174 3.9	25 22.7	173 31.7	26 10.7	172 59.5	6 5.1
10 55	25 15.8	175 31.5	26 4.3	175 1.0	26 52.8	174 30.5	6 7.8
11 0	25 54.7	176 59.0	26 43.7	176 30.2	27 32.7	176 1.4	6 10.1
11 5	–26 31.5	178 26.2	–27 21.0	177 59.2	–28 10.5	177 32.2	6 12.0
11 10	27 6.2	179 53.7 E.	27 56.3	179 28.5 E.	28 46.4	179 3.3 E.	6 13.6
11 15	27 38.7	178 38.3 W.	28 29.4	179 1.7 W.	29 20.1	179 25.1 W.	6 14.8
11 20	28 9.3	177 9.5	29 0.5	177 31.0	29 51.7	177 52.5	6 15.7
11 25	28 37.7	175 39.6	29 29.4	175 59.1	30 21 1	176 18.6	6 16.0
11 30	–29 4.0	174 8.2	–29 56.2	174 25.7	–30 48.4	174 43.2	6 15.9
11 35	29 28.1	172 35.3	30 20.8	172 50.6	31 13 5	173 5.9	6 15.5
11 40	29 50.0	171 0.5	30 43.2	171 13.6	31 36.4	171 26.7	6 14.7
11 45	30 9.6	169 23.4	31 3.3	169 34.2	31 57.0	169 45.0	6 13.4
11 50	30 26.8	167 43.9	31 21.0	167 52.3	32 15.2	168 0.7	6 11.7
11 55	–30 41.6	166 1.7	–31 36.2	166 7.5	–32 30.8	166 13.3	6 9.6
12 0	30 53.7	164 16.2	31 48.8	164 19.3	32 43.9	164 22.4	6 7.1
12 5	31 3.1	162 27.0	31 58.6	162 27.4	32 54.1	162 27.8	6 4.1
12 10	31 9.7	160 33.7	32 5.5	160 31.3	33 1.3	160 28.9	6 0.7
12 15	31 13.3	158 35.9	32 9.3	158 30.5	33 5.3	158 25.1	5 56.8
12 20	–31 13.5	156 33.0	–32 9.8	156 24.3	–33 6.1	156 15.6	5 52.5
12 25	31 10.0	154 24.4	32 6.5	154 11.9	33 3.0	153 59.4	5 48.0
12 30	31 2.6	152 9.1	31 59.2	151 52.4	32 55.8	151 35.7	5 43.0
12 35	30 50.9	149 45.7	31 47.3	149 24.3	32 43.7	149 2.9	5 37.7
12 40	30 34.3	147 12.5	31 30.3	146 46.0	32 26.3	146 19.5	5 31.9
12 45	–30 11.8	144 27.3	–31 7.3	143 55.2	–32 2.8	143 23.1	5 25.8
12 50	29 42.1	141 26.7	30 37.1	140 48.6	31 32.1	140 10.5	5 19.3
12 55	29 3.5	138 5.7	29 57.8	137 20.7	30 52.1	136 35.7	5 12.3
13 0	28 12.9	134 16.1	29 6.3	133 22.8	29 59.7	132 29.5	5 4.8
13 5	27 6.2	129 44.7	27 56.9	128 37.7	28 47.6	127 30.7	4 55.7
13 10	–25 28.0	123 53.5	–26 12.0	122 19.8	–26 56.0	120 46.1	4 46.2
13 15	21 32.5	118 46.9	22 20.0	112 35.0	23 7.5	106 23.1	4 29.1
Limits	–20 6.0	106 25.2 W.	–21 16.7	105 46.3 W.	–22 20.0	105 11.7 W.	

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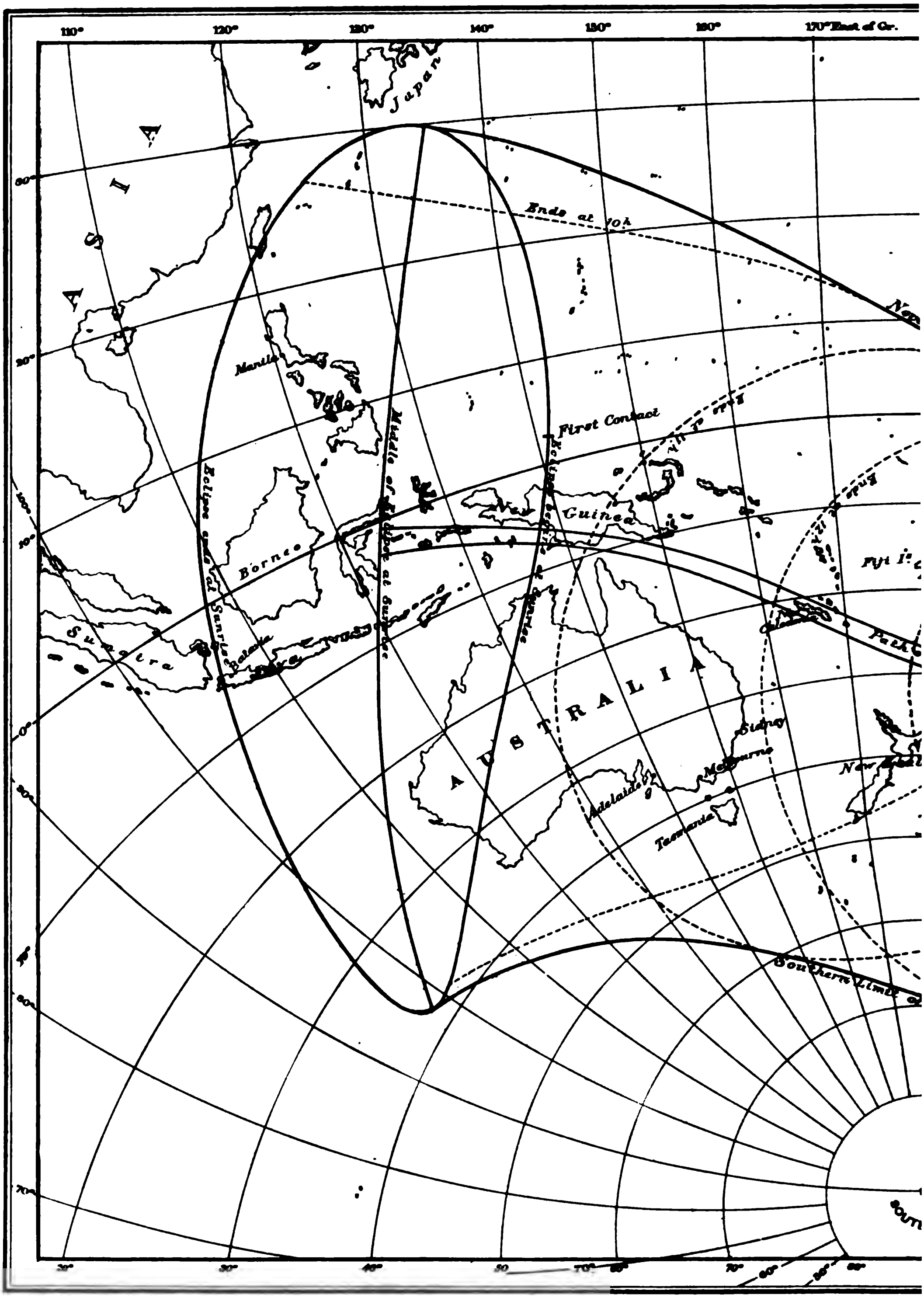
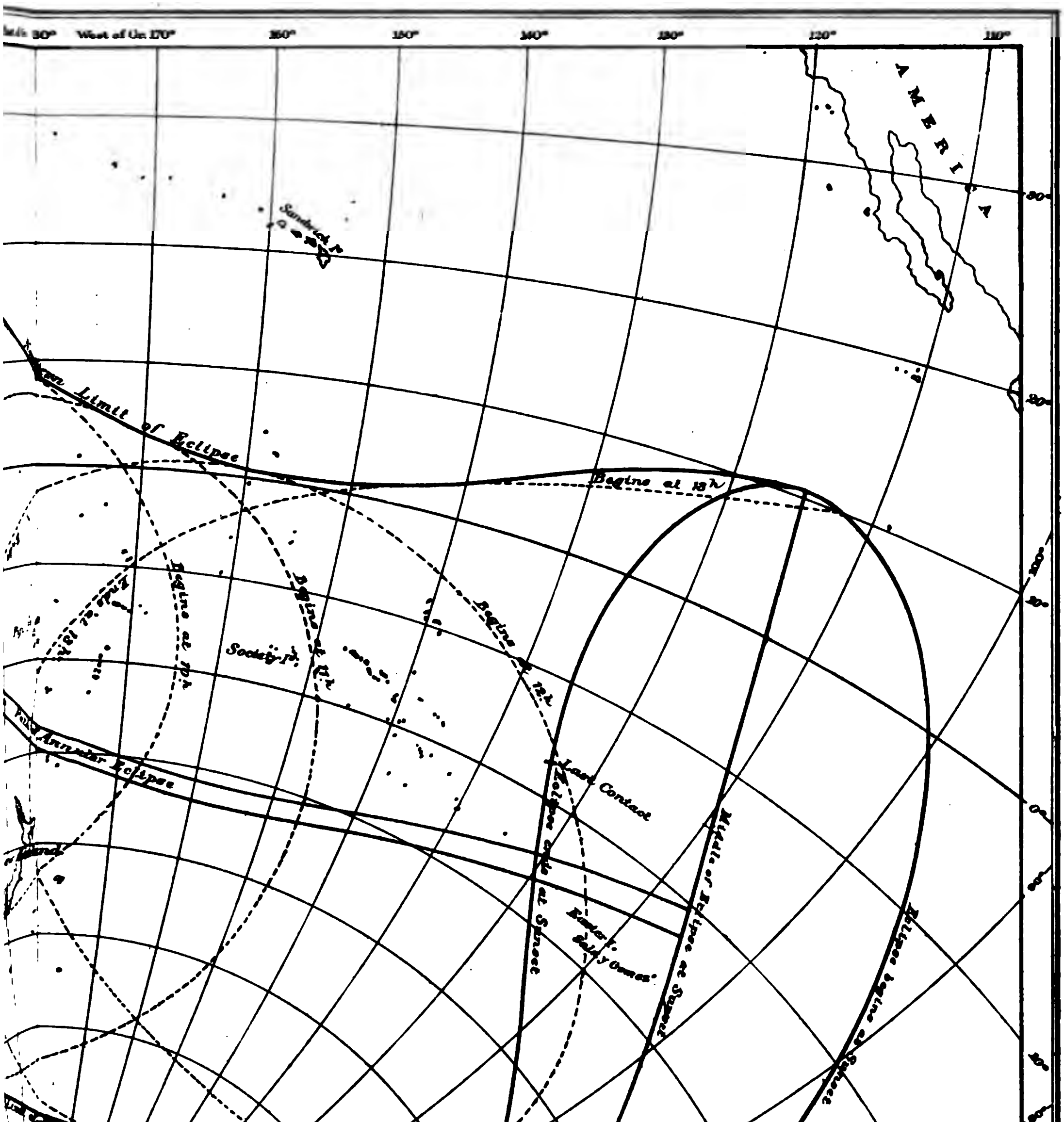


Note. *The hours of beginning and ending*

E OF NOVEMBER 10TH 1882.



ding are expressed in Greenwich Mean Time.

ELEMENTS OF THE TRANSIT OF VENUS, 1882, DECEMBER 6,

According to HILL'S *Tables of Venus, and* HANSEN'S *Tables of the Sun.*

APPARENT GEOCENTRIC POSITIONS OF THE SUN.

Greenwich Mean Time.	App. R. A. = α′	App. Decl. = δ′	App. Long.	App. Lat.	Log Dist.
d h	° ′ ″	° ′ ″	° ′ ″	° ′ ″	
Dec. 6 0	252 58 56.18	−22 31 49.37	254 18 57.91	−0 0 0.13	9.9934373
6 1	253 1 40.07	22 32 7.09	254 21 30.32	0 0 0.13	9.9934350
6 2	253 4 23.97	22 32 24.77	254 24 2.73	0 0 0.12	9.9934327
6 3	253 7 7.88	22 32 42.40	254 26 35.14	0 0 0.12	9.9934304
6 4	253 9 51.81	22 32 59.99	254 29 7.56	0 0 0.11	9.9934282
6 5	253 12 35.75	22 33 17.53	254 31 39.98	0 0 0.11	9.9934260
6 6	253 15 19.70	22 33 35.02	254 34 12.39	0 0 0.10	9.9934237
6 7	253 18 3.67	22 33 52.47	254 36 44.81	0 0 0.09	9.9934215
6 8	253 20 47.66	−22 34 9.87	254 39 17.23	−0 0 0.08	9.9934192

APPARENT GEOCENTRIC POSITIONS OF VENUS.

Greenwich Mean Time.	App. R. A. = α	App. Decl. = δ	App. Long.	App. Lat.	Log Dist.
d h	° ′ ″	° ′ ″	° ′ ″	° ′ ″	
Dec. 6 0	253 17 37.36	−22 47 45.22	254 37 55.97	−0 13 50.13	9.4223868
6 1	253 16 4.11	22 46 56.00	254 36 24.93	0 13 11.08	9.4223822
6 2	253 14 30.88	22 46 6.75	254 34 53.88	0 12 32.02	9.4223784
6 3	253 12 57.67	22 45 17.48	254 33 22.84	0 11 52.96	9.4223755
6 4	253 11 24.49	22 44 28.20	254 31 51.79	0 11 13.89	9.4223736
6 5	253 9 51.33	22 43 38.90	254 30 20.75	0 10 34.82	9.4223726
6 6	253 8 18.18	22 42 49.58	254 28 49.71	0 9 55.73	9.4223725
6 7	253 6 45.06	22 42 0.24	254 27 18.67	0 9 16.64	9.4223733
6 8	253 5 11.96	−22 41 10.89	254 25 47.63	−0 8 37.54	9.4223750

POSITIONS OF THE SUN AS SEEN FROM THE CENTRE OF VENUS.

Greenwich Mean Time.	R. A. = *a*	Decl. = *d*	μ	Log Dist.
d h	° ′ ″	° ′ ″	° ′ ″	
Dec. 6 0	252 52 5.74	−22 25 58.00	2 18 11	9.8576547
6 4	253 9 17.86	−22 28 47.38	62 10 50	9.8576434
6 8	253 26 30.22	−22 31 34.98	122 3 28	9.8576317

POSITIONS OF THE POINT IN WHICH THE AXIS OF THE CONES INTERSECTS THE FUNDAMENTAL PLANE.

Greenwich Mean Time.	x	$\frac{dx}{dt}$	y	$\frac{dy}{dt}$
d h				
Dec. 6 0	+ 42.2054	− 9.67355	− 39.1341	+ 2.77107
6 4	+ 3.4907	− 9.68380	− 28.1224	+ 2.73477
6 8	− 35.2650	− 9.69405	− 17.2559	+ 2.69847

ELEMENTS OF ENVELOPING CONES.

Greenwich Mean Time.	Exterior Contacts.				Interior Contacts.			
	f	*l*	log *l*	log tan *f*	*f*	*l*	log *l*	log tan *f*
d h	′ ″				′ ″			
Dec. 6 0	22 23.92	41.1358	1.614220	7.8140	22 0.19	38.4949	1.585404	7.8062
6 4	22 23.95	41.1370	1.614232	7.8140	22 0.23	38.4961	1.585417	7.8062
6 8	22 23.99	41.1378	1.614241	7.8140	22 0.26	38.4969	1.585426	7.8062

TIMES OF THE PRINCIPAL PHASES.

			Greenwich Mean Time.		Washington Mean Time.	Latitude.	Long. W. from Greenwich.
			h m s		h m s	° ′	° ′
Contact I	begins	Dec. 6,	1 48 32.3	Dec. 5,	20 40 20.2	−47 47	270 32
	geocentric	6,	1 56 11.3	5,	20 47 59.2		
	ends	6,	2 3 57.0	5,	20 55 44.9	+50 19	93 46
Contact II	begins	Dec. 6,	2 9 1.7	Dec. 5,	21 0 49.6	−50 17	272 48
	geocentric	6,	2 17 2.4	5,	21 8 50.3		
	ends	6,	2 25 14.2	5,	21 17 2.1	+53 9	95 34
Contact III	begins	Dec. 6,	7 45 39.7	Dec. 6,	2 37 27.6	+26 9	39 54
	geocentric	6,	7 53 51.5	6,	2 45 39.4		
	ends	6,	8 1 52.7	6,	2 53 40.6	−23 10	223 50
Contact IV	begins	Dec. 6,	8 6 56.2	Dec. 6,	2 58 44.1	+22 56	43 39
	geocentric	6,	8 14 42.5	6,	3 6 30.4		
	ends	6,	8 22 19.8	6,	3 14 7.7	−20 22	227 37

ELEMENTS FOR COMPUTING TIMES OF CONTACTS AT ANY POINT ON THE EARTH'S SURFACE.

					Motion of *A*, *B*, and *C* in 1 Second.	
	Log *E*	Log *F*	Log *G*	Log *H*	*A*′	*B*′ and *C*′
Contact I	+9.96458	+9.96692	−9.58882	−9.57513	0.0026 885	0.0007 647
Contact II	+9.96459	+9.96689	−9.58878	−9.57533	0.0026 886	0.0007 640
Contact III	+9.96438	+9.96668	−9.58996	−9.57655	0.0026 927	0.0007 498
Contact IV	+9.96435	+9.96669	−9.59015	−9.57650	0.0026 930	0.0007 490

Gr. Mean Time.	Contact I.				Gr. Mean Time.	Contact II.			
	A	*B*	*C*	*μ*		*A*	*B*	*C*	*μ*
h m				° ′	h m				° ′
1 48	+24.7889	+6.9754	−75.2972	29 14.9	2 9	+21.4013	+5.2982	−71.6927	34 14.3
1 49	24.6276	7.0213	75.2513	29 29.9	2 10	21.2399	5.3441	71.6469	34 29.3
1 50	24.4663	7.0671	75.2055	29 44.9	2 11	21.0786	5.3900	71.6010	34 44.2
1 51	24.3050	7.1130	75.1596	29 59.8	2 12	20.9173	5.4358	71.5552	34 59.2
1 52	+24.1437	+7.1589	−75.1137	30 14.8	2 13	+20.7560	+5.4816	−71.5094	35 14.2
1 53	23.9824	7.2048	75.0678	30 29.8	2 14	20.5947	5.5275	71.4635	35 29.1
1 54	23.8210	7.2506	75.0220	30 44.7	2 15	20.4333	5.5733	71.4177	35 44.1
1 55	23.6597	7.2965	74.9761	30 59.7	2 16	20.2720	5.6192	71.3718	35 59.1
1 56	+23.4984	+7.3424	−74.9302	31 14.7	2 17	+20.1107	+5.6650	−71.3260	36 14.1
1 57	23.3371	7.3883	74.8843	31 29.6	2 18	19.9494	5.7108	71.2802	36 29.0
1 58	23.1758	7.4341	74.8385	31 44.6	2 19	19.7881	5.7567	71.2343	36 44.0
1 59	23.0145	7.4800	74.7926	31 59.6	2 20	19.6267	5.8025	71.1885	36 59.0
2 0	+22.8532	+7.5259	−74.7467	32 14.5	2 21	+19.4654	+5.8484	−71.1426	37 13.9
2 1	22.6919	7.5718	74.7008	32 29.5	2 22	19.3041	5.8942	71.0968	37 28.9
2 2	22.5306	7.6176	74.6550	32 44.5	2 23	19.1428	5.9400	71.0510	37 43.9
2 3	22.3693	7.6635	74.6091	32 59.5	2 24	18.9815	5.9859	71.0051	37 58.8
2 4	+22.2079	+7.7094	−74.5632	33 14.4	2 25	+18.8201	+6.0317	−70.9593	38 13.8

ELEMENTS FOR COMPUTING TIMES OF CONTACTS, ETC.—Continued.

Gr. Mean Time.	Contact III.				Gr. Mean Timo.	Contact IV.			
	A	*B*	*C*	μ		*A*	*B*	*C*	μ
h m				° ′	h m				° ′
7 45	-32.8415	+20.5660	-56.4276	118 4.0	8 6	-36.2344	+24.1516	-58.1238	123 33.3
7 46	33.0031	20.6110	56.3826	118 19.0	8 7	36.3960	24.1965	58.0789	123 48.3
7 47	33.1646	20.6560	56.3376	118 34.0	8 8	36.5576	24.2415	58.0339	124 3.3
7 48	33.3262	20.7010	56.2926	118 48.9	8 9	36.7191	24.2864	57.9890	124 18.2
7 49	-33.4877	+20.7460	-56.2476	119 3.9	8 10	-36.8807	+24.3313	-57.9440	124 33.2
7 50	33.6493	20.7909	56.2026	119 18.9	8 11	37.0423	24.3763	57.8991	124 48.2
7 51	33.8109	20.8359	56.1577	119 33.8	8 12	37.2039	24.4212	57.8542	125 3.1
7 52	33.9724	20.8809	56.1127	119 48.8	8 13	37.3655	24.4662	57.8092	125 18.1
7 53	-34.1340	+20.9259	-56.0677	120 3.8	8 14	-37.5270	+24.5112	-57.7643	125 33.1
7 54	34.2955	20.9709	56.0227	120 18.7	8 15	37.6886	24.5560	57.7193	125 48.0
7 55	34.4571	21.0159	55.9777	120 33.7	8 16	37.8502	24.6010	57.6744	126 3.0
7 56	34.6187	21.0609	55.9327	120 48.7	8 17	38.0118	24.6459	57.6295	126 18.0
7 57	-34.7802	+21.1059	-55.8877	121 3.6	8 18	-38.1734	+24.6909	-57.5845	126 32.9
7 58	34.9418	21.1509	55.8427	121 18.6	8 19	38.3349	24.7358	57.5396	126 47.9
7 59	35.1033	21.1959	55.7977	121 33.6	8 20	38.4965	24.7807	57.4946	127 2.9
8 0	35.2649	21.2408	55.7528	121 48.5	8 21	38.6581	24.8257	57.4497	127 17.8
8 1	-35.4265	+21.2858	-55.7078	122 3.5	8 22	-38.8197	+24.8706	-57.4048	127 32.8

FORMULÆ FOR USING THE ELEMENTS.

If an assumed time of contact at any place, T_0, be taken, the exact time may be computed by the following formulæ, in connection with the tables:—

Put φ', geocentric latitude of the place,
λ, longitude west from Greenwich,
ρ, distance from Earth's centre.

$$h = \rho \cos \varphi'$$
$$k = \rho \sin \varphi'$$

The values of h and k, or $\rho \cos \varphi'$ and $\rho \sin \varphi'$ may be computed by the formulæ given in connection with the explanation of the eclipse elements at the end of this volume.

$$\begin{aligned} a &= A - h \sin (\mu - \lambda) \\ b &= B - Ek + Gh \cos (\mu - \lambda) \\ c &= -C + Fk - Hh \cos (\mu - \lambda) \\ m &= \sqrt{bc} \quad \text{(usually with the same sign as } a\text{)} \end{aligned}$$

If $m = a$, T_0 is the correct time. If not, a correction of T_0 may be obtained, in seconds, by the formulæ,

$$\log \mu' = 9.8617 \qquad a' = A' - \mu' h \cos (\mu - \lambda)$$

$$\tan \tfrac{1}{2} Q = \frac{c}{m} = \frac{m}{b} \qquad b' = B' - \mu' h G \sin (\mu - \lambda)$$

$$t = \frac{10000\,(m - a)}{a' + b' \cot Q}, \text{ in which } Q \text{ has the same sign as } a.$$

The Greenwich mean time of contact will be

$$T_0 + t$$

and the local mean time,

$$T_0 + t - \lambda$$

To find V, the angular distance of the point of contact from the vertex of the sun's limb toward the left, we have the formulæ,

$$\begin{aligned} p \sin P &= \sin \varphi \\ p \cos P &= \cos \varphi \cos (\mu - \lambda) \\ c \sin C &= \cos P \tan (\mu - \lambda) \\ c \cos C &= \sin (P - \delta') \\ V &= Q - C \end{aligned}$$

in which δ' is the sun's declination, and Q the position angle reckoned from the north toward the east

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DIRECTIONS FOR USING THE CHARTS OF THE TRANSIT OF VENUS.

The centre of each chart is in latitude 22° 30′ south. The longitudes west from Greenwich are noted along the equator, and the latitudes on the middle meridian.

The outside curve marked "Contact on the Horizon," nearly a circle, encloses all of the earth's surface on which the contact will be visible. On the left side of the curve, the sun will be rising at the time of contact, and on the right, setting.

To find the altitude of Venus and the sun up to 30°, at the time of contact, at any station, compare the shortest distance of the station from the curve, with the "Scale for Altitudes," given at the bottom of the chart.

If a line be drawn from any station to the centre of the chart, the azimuth of the sun at the moment of contact will be nearly the angle which that line makes with the meridian of the station.

The closely dotted lines pass through all the stations at which contact takes place at the minute of Greenwich mean time indicated at the ends of the lines. By noting between what two lines a station lies, we shall find between what minutes of Greenwich mean time contact occurs. For ingress in the United States, the lines are drawn for every ten seconds.

As the uncertainty of the tabular elements renders the computed times of contact doubtful by a large fraction of a minute, the times taken from the chart will be as accurate as any that can be computed.

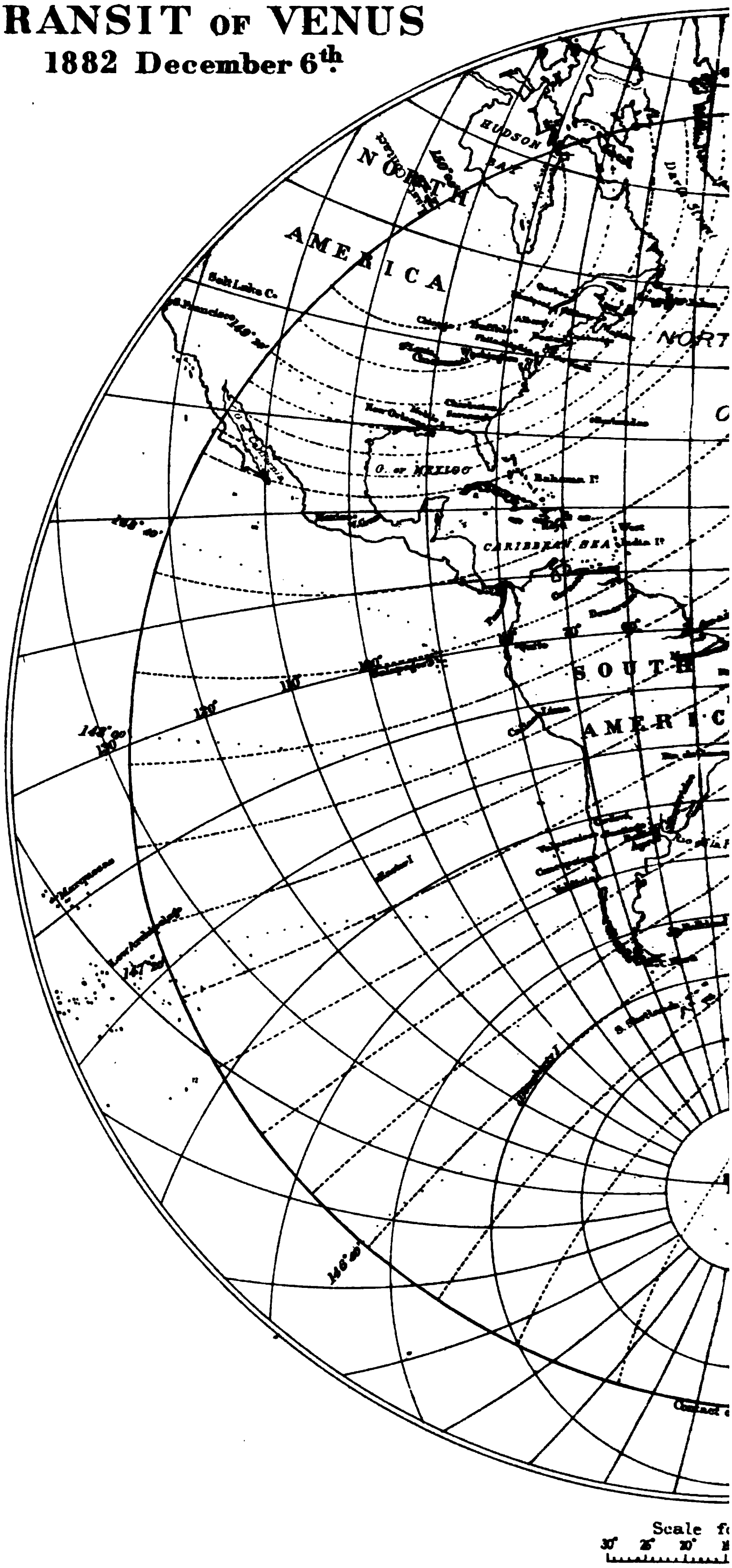
The fainter and more widely dotted lines pass through the stations at which contact occurs at the position angle given at the end of the line.

The position angle for first external contact may be found by subtracting 3° 20′ from that for internal contact, and that for second external contact by adding 3° 20′ to the value for second internal contact.

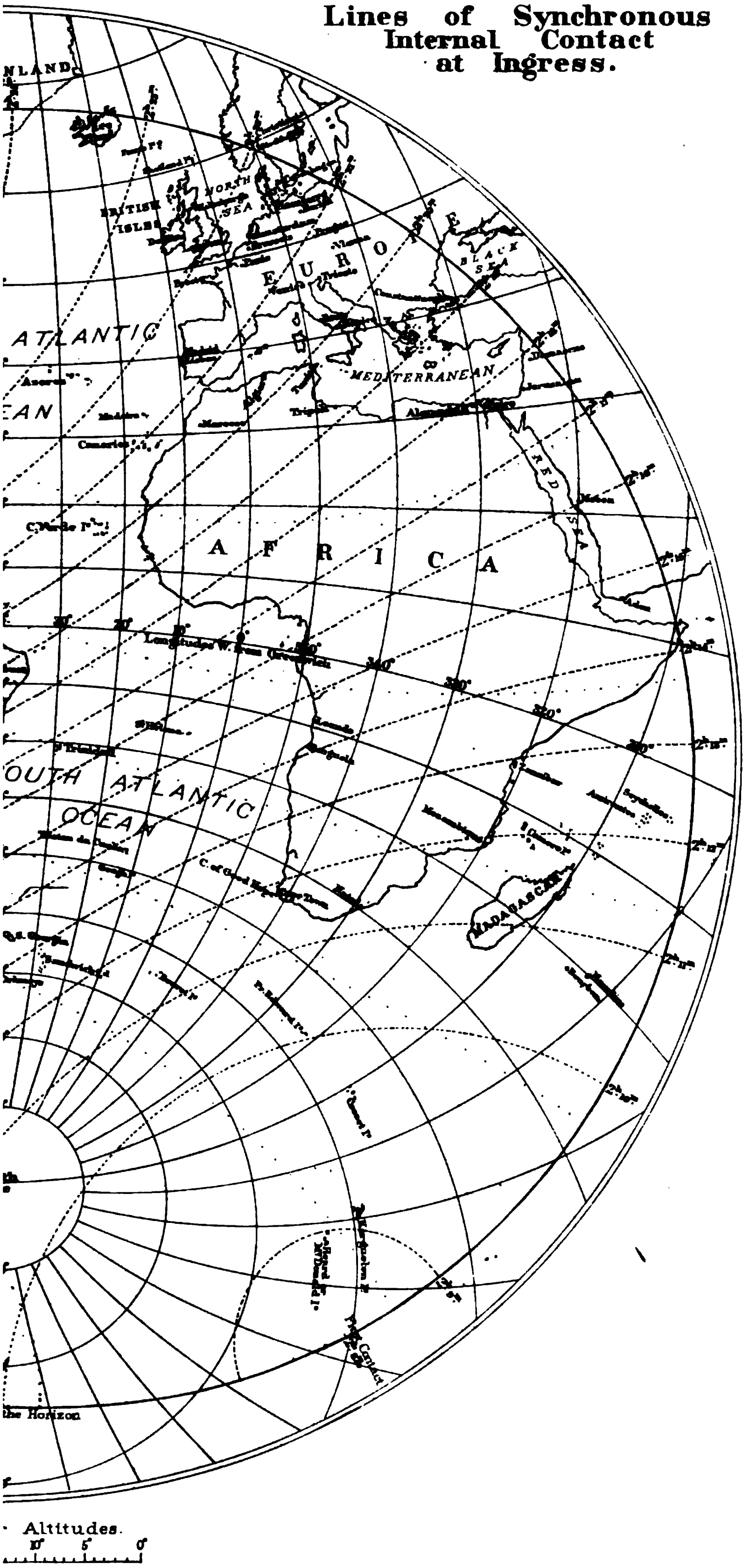
Thus, we find for Washington: —

Internal contact at ingress	149° 50′
Correction	3° 20′
Position angle for first external contact	146° 30′

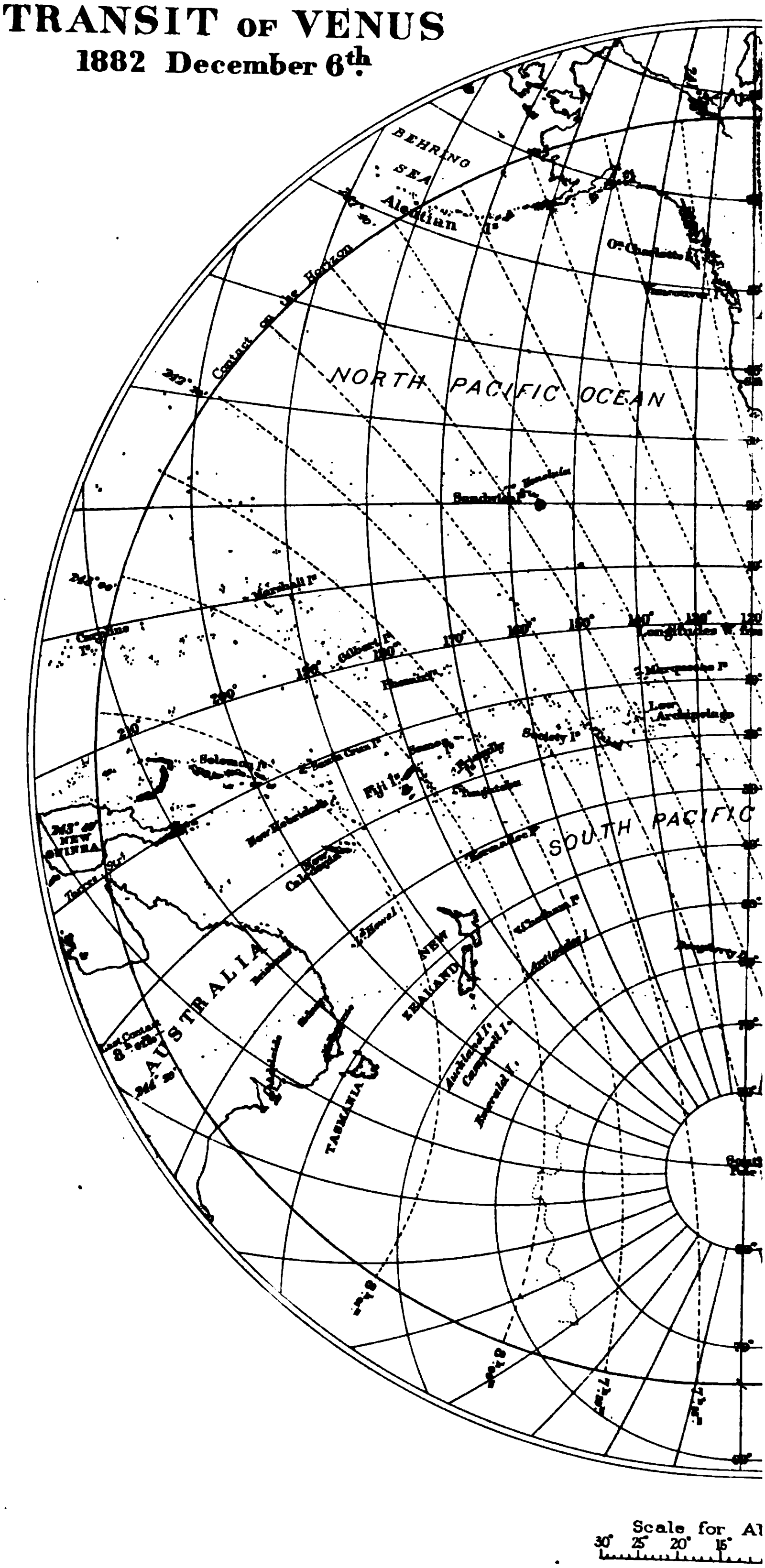
TRANSIT OF VENUS
1882 December 6th.

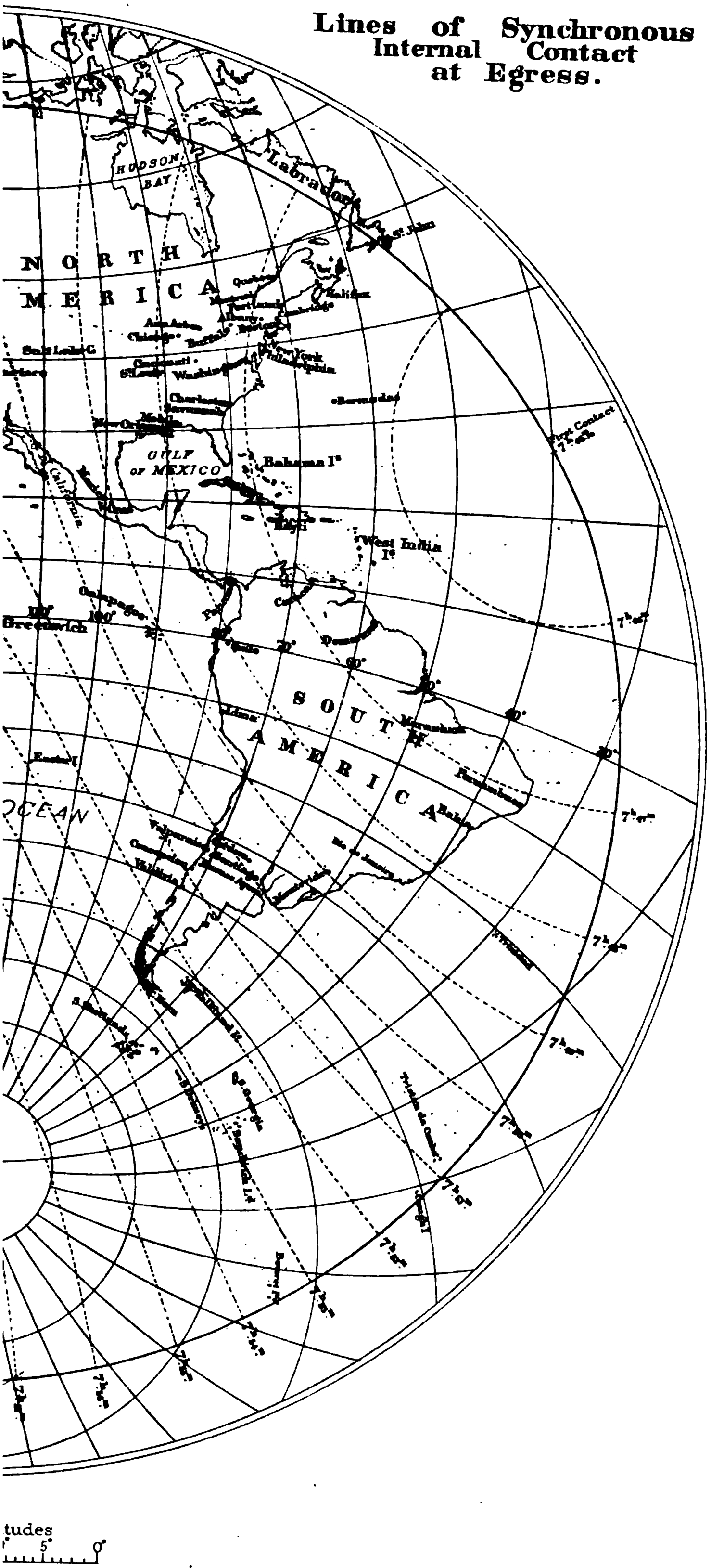


Lines of Synchronous Internal Contact at Ingress.



TRANSIT OF VENUS
1882 December 6th





Lines of Synchronous Internal Contact at Egress.

Ne

January
Februar
March
April
May
June
July
August
Septem
Octobe
Novem
Decem

Jan
Fel
Ma
Ma
Ap
Ma
Ju
Ju
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WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.				First Quarter.				Full Moon.				Last Quarter.			
	d	h	m		d	h	m		d	h	m		d	h	m
January	18	23	26.9	January	25	14	36.7	January	3	17	50.3	January	11	22	39.4
February	17	9	41.7	February	24	4	22.6	February	2	12	49.8	February	10	15	25.9
March	18	19	9.5	March	25	20	24.8	March	4	7	31.5	March	12	4	20.0
April	17	4	30.3	April	24	13	47.5	April	3	0	38.8	April	10	13	22.2
May	16	14	24.9	May	24	7	32.6	May	2	15	22.8	May	9	19	27.1
June	15	1	25.2	June	23	0	52.9	June	1	3	25.2	June	8	0	1.9
July	14	13	53.2	July	22	17	9.3	June	30	13	0.4	July	7	4	44.2
August	13	4	1.8	August	21	7	46.6	July	29	20	53.7	August	5	11	5.4
September	11	19	50.5	September	19	20	19.7	August	28	4	10.7	September	3	20	18.5
October	11	12	53.3	October	19	6	46.5	September	26	12	2.0	October	3	9	9.4
November	10	6	11.4	November	17	15	33.5	October	25	21	25.7	November	2	1	49.7
December	9	22	29.4	December	16	23	31.4	November	24	8	54.5	December	1	21	48.2
								December	23	22	33.2	December	31	19	42.0

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Apogee.			Perigee.			Greatest Libration.							
	d	h		d	h		d	h	m		d	h	m
January	7	10.4	January	19	20.0	January	13	23	31 E.	January	26	3	48 W.
February	3	17.9	February	17	8.2	February	11	6	52 E.	February	23	9	6 W.
March	2	18.0	March	17	19.2	March	11	9	55 E.	March	23	16	5 W.
March	30	4.1	April	14	23.9	April	7	21	44 E.	April	20	18	52 W.
April	26	21.1	May	12	9.3	May	4	6	53 E.	May	18	12	5 W.
May	24	15.3	June	6	13.7	May	30	23	39 E.	June	14	12	14 W.
June	21	10.4	July	3	8.4	June	27	11	55 E.	July	11	19	43 W.
July	19	3.2	July	31	7.6	July	25	10	58 E.	August	7	22	21 W.
August	15	16.4	August	28	15.3	August	22	15	14 E.	September	3	20	4 W.
September	11	20.3	September	26	1.8	September	19	21	3 E.	October	2	0	55 W.
October	9	0.2	October	24	11.8	October	17	21	9 E.	October	30	6	34 W.
November	5	12.9	November	21	13.7	November	13	23	21 E.	November	27	7	51 W.
December	3	8.1	December	18	2.9	December	10	2	47 E.	December	24	20	32 W.
December	31	5.5											

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I, the inclination of the moon's equator to the ecliptic ($= 1^\circ\ 28'.8$),

Ω, the mean longitude of the moon's ascending node, (see page 278), or the mean longitude of the descending node of the moon's equator,

C, the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

λ, β, a', δ', the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ', the selenocentric longitude of the earth, counted on the moon's equator from its descending node, Ω,

i, Δ, Ω', ☾, the quantities defined on page 276, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 276 and 277: —

$$\left.\begin{aligned} \Delta\,\lambda &= -\,0'.57 \sin 2\,(\Omega - \lambda) \\ a &= \sin I \cos\,(\Omega - \lambda) \\ \tan B &= \tan I \sin\,(\Omega - \lambda) \\ \lambda' &= \lambda + \Delta\,\lambda + a\,b \end{aligned}\right\} \textit{See table, page 277.}$$

$$\text{The libration in latitude} = b = B - \beta$$

$$\text{The libration in longitude} = l = \lambda' - \text{☾}$$

$$\sin C = \sin i\,\frac{\cos\,(\lambda' + \Delta - \Omega)}{\cos \delta'} = -\,\sin i\,\frac{\cos\,(a' - \Omega')}{\cos b}$$

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
Rumker 1250	6½	+2.49	+ 1.3	+22 42.9	1 0 26.6	- 9 23.6	-0.8984	0.5651	+0.0302	-16	-68
τ Tauri	4½	2.49	+ 1.3	22 43.8	0 27.8	- 9 22.4	-0.9137	0.5651	0.0302	-17	-68
ι Tauri	5	2.52	- 0.3	21 25.2	9 41.5	- 0 28.1	+0.6866	0.5643	0.0111	+90	+21
105 Tauri	6	2.54	0.5	21 32.8	11 49.7	+ 1 35.7	+0.5688	0.5640	+0.0065	+79	+15
n Tauri	6	2.57	1.1	21 58.4	16 51.2	+ 6 26.7	+0.1147	0.5634	-0.0040	+45	- 9
o Tauri	6	+2.59	- 1.7	+21 50.0	20 34.4	+10 2.1	+0.2372	0.5628	-0.0116	+53	- 3
ζ Tauri	3½	2.60	2.5	21 4.1	2 1 3.5	- 9 38.0	+0.9947	0.5619	0.0208	+90	+40
B. A. C. 1835	6½	2.61	3.1	20 49.5	5 52.2	- 4 59.3	+1.1368	0.5607	0.0306	+90	+51
141 Tauri	6	2.65	3.9	22 23.7	11 50.1	+ 0 46.4	-0.7863	0.5591	0.0425	- 8	-68
B. A. C. 1970	6½	2.66	4.3	22 12.4	15 23.5	+ 4 12.5	-0.7471	0.5581	0.0470	- 5	-68
η Geminorum	3½	+2.67	- 4.7	+22 32.3	17 48.9	+ 6 33.0	-1.2337	0.5572	-0.0543	-49	-68
B. A. C. 2039	6½	2.65	5.1	21 15.0	20 48.2	+ 9 26.2	-0.0003	0.5563	0.0599	+38	-21
15 Geminorum	6	2.65	5.6	20 51.5	23 45.0	-11 43.0	+0.2413	0.5551	0.0655	+53	- 8
16 Geminorum	6	2.64	5.6	20 33.9	23 50.0	-11 38.1	+0.5576	0.5551	0.0657	+78	+ 9
ν Geminorum	4½	2.64	5.6	20 17.0	3 0 18.3	-11 10.8	+0.8331	0.5549	0.0665	+90	+25
ζ Geminorum	4	+2.64	- 7.7	+20 44.4	16 37.9	+ 4 36.3	-0.9945	0.5482	-0.0958	-21	-70
B. A. C. 2432	6½	2.60	8.6	18 29.7	4 1 41.3	-10 37.9	+0.5339	0.5443	0.1106	+75	+ 3
f Geminorum	6	2.56	9.4	17 56.4	9 35.1	- 2 59.2	+0.2245	0.5406	0.1145	+52	-15
g Geminorum	5½	2.57	9.8	18 47.6	12 48.2	+ 0 7.8	-1.1194	0.5390	0.1274	-32	-71
1 Cancri	6	2.52	10.1	16 6.1	18 10.9	+ 5 20.4	+1.1426	0.5363	0.1349	+90	+40
3 Cancri	6	+2.53	-10.4	+17 37.7	20 1.1	+ 7 1.1	-0.7907	0.5354	-0.1375	- 7	-73
5 Cancri	6	2.52	10.3	16 46.6	20 23.4	+ 7 28.8	+0.0972	0.5353	0.1379	+44	-24
B. A. C. 2731	6½	2.51	10.8	17 21.5	5 0 35.8	+11 33.4	-1.1374	0.5331	0.1433	-33	-73
29 Cancri	6	2.43	11.3	14 35.8	9 59.5	- 3 20.2	+0.5118	0.5286	0.1548	+72	- 4
B. A. C. 2872	6½	2.42	11.3	13 39.5	12 36.6	- 0 47.7	+1.1413	0.5274	0.1577	+90	+38
A^1 Cancri	6	+2.39	-11.6	+13 6.0	17 26.5	+ 3 53.4	+0.9856	0.5253	-0.1630	+90	+24
A^2 Cancri	6	2.37	11.7	12 32.3	19 22.3	+ 5 45.7	+1.2909	0.5245	0.1649	+90	+54
60 Cancri	6	2.35	11.8	12 4.4	6 0 0.6	+10 15.8	+1.0318	0.5226	0.1694	+90	+26
α Cancri	4	2.33	12.1	12 18.6	1 19.8	+11 32.6	+0.5444	0.5220	0.1708	+74	- 4
κ Cancri	5	2.31	12.1	11 8.3	6 10.3	- 7 45.3	+1.0060	0.5201	0.1752	+90	+24
B. A. C. 3122	6½	+2.30	-12.3	+12 2.4	7 14.0	- 6 43.6	-0.1811	0.5196	-0.1761	+28	-44
ω Leonis	6	2.23	12.3	9 34.0	17 5.3	+ 2 50.6	+0.7896	0.5161	0.1839	+90	+ 8
h Leonis	6	2.22	12.5	10 13.9	18 57.0	+ 4 39.1	-0.2927	0.5155	0.1853	+22	-52
14 Sextantis	6	2.08	12.2	6 11.0	7 13 41.2	- 1 8.6	+0.6238	0.5100	0.1962	+81	- 3
16 Sextantis	6½	2.07	12.3	6 44.7	15 0.6	+ 0 8.6	-0.2607	0.5097	0.1968	+24	-52
19 Sextantis	6½	+2.05	-12.0	+ 5 11.6	16 57.6	+ 2 2.3	+1.0780	0.5093	-0.1976	+90	+26
Yarnall 4339	6½	2.00	11.9	4 31.7	8 0 24.1	+ 9 16.3	+0.3352	0.5080	0.2004	+58	-20
34 Sextantis	6	1.92	11.9	4 11.7	9 13.2	- 6 9.3	-1.0737	0.5070	0.2029	-24	-86
36 Sextantis	6	1.92	11.6	3 6.3	10 36.6	- 4 48.2	-0.1458	0.5068	0.2032	+30	-46
B. A. C. 3726	6	1.91	11.1	1 38.9	14 29.1	- 1 2.2	+0.6817	0.5066	0.2039	+87	- 1
55 Leonis	6	+1.88	-11.1	+ 1 21.8	16 22.9	+ 0 48.4	+0.6105	0.5065	-0.2041	+79	- 5
B. A. C. 3779	6	1.86	10.7	0 6.6	20 25.9	+ 4 44.7	+1.1695	0.5065	0.2046	+90	+32
p^2 Leonis	6	1.86	10.8	0 37.9	20 43.2	+ 5 1.5	+0.5339	0.5065	0.2046	+72	- 9
p^5 Leonis	5	1.81	10.9	+ 0 34.1	9 2 16.1	+10 25.2	-0.5337	0.5066	0.2050	+ 9	-72
B. A. C. 3901	6	1.74	10.2	- 1 3.2	9 59.1	- 6 4.6	-0.3202	0.5072	0.2049	+21	-57
B. A. C. 3903	6½	+1.74	-10.4	- 0 15.1	10 4.0	- 5 59.8	-1.2232	0.5072	-0.2049	-37	-90
e Leonis	4½	1.74	9.7	2 21.3	11 18.0	- 4 47.9	+0.8492	0.5073	0.2048	+88	+ 9
B. A. C. 3955	5½	1.69	9.8	1 47.2	15 41.6	- 0 31.7	-0.6776	0.5079	0.2043	+ 1	-87
B. A. C. 4006	6	1.65	8.8	4 40.8	22 32.0	+ 6 7.2	+1.1200	0.5093	0.2030	+86	+28
B. A. C. 4201	6½	1.50	7.1	8 1.4	10 18 13.0	+ 1 14.5	+0.8500	0.5152	0.1962	+82	+ 9
q Virginis	6	+1.48	- 6.7	- 8 48.2	21 16.2	+ 4 12.4	+1.1048	0.5163	-0.1947	+81	+27
χ Virginis	5	1.44	7.1	7 20.9	11 0 7.7	+ 6 59.0	-1.0394	0.5176	0.1932	-24	-90
B. A. C. 4259	6	1.44	7.1	7 23.1	0 12.3	+ 7 3.5	-1.0134	0.5176	0.1932	-22	-90
B. A. C. 4312	6½	1.40	6.1	9 41.9	6 24.1	-10 55.7	+0.3243	0.5204	0.1894	+54	-20
ψ Virginis	5	1.38	6.3	8 54.0	7 56.3	- 9 26.2	-0.8354	0.5211	0.1884	-11	-90
g Virginis	6	+1.32	- 5.6	-10 6.6	14 50.4	- 2 44.4	-0.8002	0.5246	-0.1835	- 9	-90
i Virginis	5½	+1.25	- 4.4	-12 5.7	12 0 16.3	+ 6 24.2	-0.3449	0.5301	-0.1757	+15	-58

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 4531	6	+1.22	- 4.1	-12 36.6	12 4 11.7	+10 12.3	-0.4692	0.5325	-0.1720	+ 8	-68
B. A. C. 4679	6½	1.09	2.3	14 24.2	18 32.9	+ 0 6.2	-0.8989	0.5424	0.1562	-19	-90
B. A. C. 4700	5½	1.06	2.1	15 44.7	21 32.7	+ 3 0.2	+0.0711	0.5445	0.1527	+35	-34
B. A. C. 4896	6	0.87	- 0.6	17 17.9	13 16 12.1	- 2 58.0	-0.8835	0.5588	0.1258	-23	-90
ι^1 Libræ	4½	0.78	+ 0.5	19 20.6	14 1 17.0	+ 5 48.0	+.01924	0.5658	0.1107	+36	-38
ι^2 Libræ	6	+0.78	+ 0.6	-19 12.1	1 45.9	+ 6 15.8	-0.0096	0.5662	-0.1098	+24	-38
Yarnall 6277	6½	0.77	0.9	20 17.2	3 42.6	+ 8 8.4	+0.7152	0.5677	0.1064	+70	+16
B. A. C. 5109	6½	0.68	1.0	19 16.0	10 4.2	- 9 43.7	-0.7884	0.5728	0.0945	-20	-90
κ Libræ	5	0.64	1.2	19 17.7	14 1.7	- 5 55.0	-1.1143	0.5758	0.0866	-44	-90
λ Libræ	6	0.60	1.5	19 48.8	18 47.5	- 1 19.7	-0.9636	0.5792	0.0770	-33	-90
B. A. C. 5278	6	+0.60	+ 2.0	-21 8.4	20 22.8	+ 0 12.1	+0.2907	0.5804	-0.0737	+41	-21
B. A. C. 5281	6	0.58	1.8	20 38.4	20 34.9	+ 0 23.7	-0.2427	0.5805	0.0733	+ 9	-53
ω^1 Scorpii	4½	0.53	1.8	20 20.9	15 0 21.7	+ 4 2.0	-0.8033	0.5833	0.0651	-23	-90
ω^2 Scorpii	5	0.54	1.9	20 32.9	0 36.0	+ 4 15.7	-0.6123	0.5834	0.0647	-12	-84
B. A. C. 5395	6	0.51	2.1	21 5.8	3 10.1	+ 6 44.1	-0.2049	0.5851	0.0589	+ 9	-51
ω Ophiuchi	5	+0.44	+ 2.5	-21 12.7	10 38.8	-10 4.5	-0.4624	0.5900	-0.0419	- 6	-69
24 Ophiuchi	6½	0.35	3.3	22 57.7	20 26.6	- 0 39.6	+1.0221	0.5955	0.0186	+67	+25
B. A. C. 5758	6	0.29	3.1	21 23.9	16 0 10.8	+ 2 55.8	-0.6167	0.5974	0.0095	-18	-84
Yarnall 7137	6½	0.24	3.0	20 49.8	3 35.8	+ 6 12.6	-1.2095	0.5989	-0.0011	-61	-90
ξ Ophiuchi	5	0.23	3.1	20 59.0	5 58.3	+ 8 29.5	-1.0471	0.5999	+0.0049	-46	-90
B. A. C. 5866	6	+0.22	+ 3.2	-21 57.7	7 24.9	+ 9 42.1	-0.6738	0.6005	+0.0086	-22	-90
B. A. C. 5954	6	0.19	3.4	21 50.4	12 51.7	- 8 53.7	-0.0869	0.6025	0.0224	+12	-43
58 Ophiuchi	5	0.17	3.4	21 37.4	14 40.8	- 7 9.0	-0.2602	0.6031	0.0270	+ 3	-54
B. A. C. 5992	6½	0.18	3.5	22 8.4	15 2.2	- 6 48.5	+0.2655	0.6032	0.0280	+33	-23
B. A. C. 6088	6	0.15	3.6	22 46.5	21 46.3	- 0 20.8	+1.1505	0.6049	0.0452	+67	+38
B. A. C. 6098	6	+0.10	+ 3.4	-20 44.1	22 5.3	- 0 2.5	-0.8780	0.6049	+0.0460	-30	-90
Yarnall 7631	6½	0.10	3.5	21 27.2	23 49.8	+ 1 37.8	-0.0744	0.6052	0.0506	+15	-43
μ Sagittarii	4½	0.08	3.5	21 5.2	17 2 21.8	+ 4 3.5	-0.3042	0.6055	0.0569	+ 4	-57
14 Sagittarii	6	0.09	3.5	21 44.5	2 32.6	+ 4 13.9	+0.3599	0.6055	0.0574	+41	-18
15 Sagittarii	5	0.07	3.4	20 45.7	2 55.6	+ 4 35.9	-0.5973	0.6056	0.0584	-12	-82
16 Sagittarii	6	+0.07	+ 3.4	-20 25.3	2 56.1	+ 4 36.4	+0.0618	0.6056	+0.0584	+24	-34
21 Sagittarii	5	0.04	3.5	20 36.1	6 49.1	+ 8 20.0	-0.5086	0.6059	0.0683	- 6	-73
				NEW	*MOON.*						
ξ Aquarii	4½	0.00	3.3	8 22.9	20 10 59.8	+ 9 30.1	-1.0947	0.5825	0.2111	-29	-90
B. A. C. 7562	6½	+0.04	+ 3.2	- 9 34.7	13 58.5	-11 37.9	+0.7117	0.5811	+0.2139	+81	+ 1
c^1 Capricorni	5½	0.04	3.2	9 37.4	14 0.6	-11 35.9	+0.7634	0.5811	0.2139	+75	+ 4
c^2 Capricorni	6½	0.04	3.2	9 49.1	14 32.2	-11 5.5	+1.0693	0.5808	0.2145	+80	+24
30 Aquarii	5½	0.07	3.5	7 5.5	21 42.9	- 4 10.7	-0.0489	0.5776	0.2200	+34	-41
Bradley 2888	6½	0.07	3.7	5 55.7	22 54.6	- 3 1.6	-0.9294	0.5769	0.2207	-15	-90
B. A. C. 7744	6	+0.10	+ 3.8	- 5 18.1	21 1 44.7	- 0 17.8	-0.9175	0.5757	+0.2224	-14	-90
44 Aquarii	5½	0.11	3.5	5 58.5	3 36.1	+ 1 29.6	+0.1586	0.5750	0.2234	+46	-29
51 Aquarii	5½	0.13	3.6	5 26.0	6 35.8	+ 4 22.7	+0.2966	0.5737	0.2249	+55	-22
κ Aquarii	5	0.18	3.5	4 50.1	12 28.1	+10 2.4	+1.0361	0.5714	0.2270	+85	+21
3 Piscium	6	0.28	4.4	0 26.8	22 24.7	- 4 22.4	-1.0366	0.5676	0.2286	-22	-90
B. A. C. 8152	6½	+0.37	+ 4.2	- 0 21.4	22 8 26.7	+ 5 18.3	+1.1663	0.5647	+0.2276	+90	+32
κ Piscium	4½	0.38	4.4	+ 0 36.6	9 57.0	+ 6 45.5	+0.5463	0.5642	0.2273	+73	+ 8
9 Piscium	6½	0.38	4.3	0 28.5	10 5.5	+ 6 53.7	+0.7131	0.5642	0.2273	+90	+ 1
Yarnall 10387	6½	0.40	4.6	1 43.0	11 47.8	+ 8 32.4	-0.1351	0.5638	0.2268	+31	-45
16 Piscium	6	0.43	4.5	1 26.9	14 8.4	+10 48.1	+0.6631	0.5632	0.2261	+85	- 2
19 Piscium	6	+0.47	+ 4.8	+ 2 50.0	18 34.3	- 8 55.3	+0.2788	0.5622	+0.2244	+54	-23
d Piscium	5½	0.66	5.5	7 32.2	23 9 48.3	+ 5 47.1	-1.0904	0.5597	0.2154	-26	-83
45 Piscium	6	0.67	5.3	7 2.4	12 5.0	+ 7 59.1	-0.1018	0.5596	0.2137	+32	-43
51 Piscium	6½	0.72	5.1	6 18.3	15 4.9	+10 52.8	+1.2782	0.5593	0.2112	+90	+46
101 Piscium	6	1.11	6.3	14 3.6	24 19 25.4	- 9 45.3	-1.0561	0.5586	0.1796	-25	-76
104 Piscium	6½	+1.15	+ 6.0	+13 41.3	20 58.8	- 8 15.1	-0.3972	0.5587	+0.1776	+16	-56
19 Arietis	6	+1.36	+ 5.3	+14 43.7	25 12 3.4	+ 6 18.4	+1.0450	0.5597	+0.1553	+90	+30

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
27 Arietis	6	+1.49	+ 5.6	+17 11.0	25 19 58.5	-10 3.0	-0.3312	0.5604	+0.1425	+20	-48
40 Arietis	6½	1.60	5.2	17 47.6	26 3 47.6	- 2 30.1	+0.0926	0.5610	0.1291	+44	-23
π Arietis	6	1.60	4.8	16 58.5	4 8.6	- 2 9.9	+0.9959	0.5610	0.1287	+90	+30
ρ¹ Arietis	6½	1.64	4.7	17 15.4	6 38.0	+ 0 14.3	+1.0153	0.5612	0.1240	+90	+32
ρ² Arietis	6	1.64	4.7	17 51.3	7 1.3	+ 0 36.8	+0.4357	0.5612	0.1232	+66	- 4
ρ³ Arietis	6	+1.65	+ 4.8	+ 17 33.2	7 17.2	+ 0 52.1	+0.7848	0.5612	+0.1229	+90	+16
54 Arietis	6½	1.73	4.4	18 20.5	12 33.9	+ 5 57.8	+0.5797	0.5617	0.1132	+79	+ 5
δ Arietis	4½	1.76	4 6	19 16.8	13 59.7	+ 7 20.6	-0.2497	0.5618	0.1107	+24	-40
B. A. C. 1032	6½	1.83	4.5	20 4.9	18 4.4	+11 16.8	-0.6610	0.5621	0.1030	+ 1	-67
τ² Arietis	5½	1.86	4.5	20 19.2	18 54.6	-11 54.7	-0.8275	0.5621	0.1015	-10	-70
65 Arietis	6	+1.86	+ 4.5	+20 23.1	19 39.0	-11 11.9	-0.8216	0.5621	+0.1000	- 9	-70
13 Tauri	6½	1.94	3.3	19 19.3	27 3 34.3	- 3 33.2	+1.0368	0.5625	0.0847	+90	+37
B. A. C. 1143	6½	1.97	3.7	20 33.2	4 29.9	- 2 39.6	-0.1945	0.5625	0.0843	+27	-34
14 Tauri	6½	1.95	3.2	19 17.5	4 13.0	- 2 55.9	+1.1236	0.5625	0.0833	+90	+45
B. A. C. 1242	6	2.05	2.4	19 52.1	11 52.2	+ 4 27.3	+1.0947	0.5624	0.0682	+90	+44
A¹ Tauri	5	+2.11	+ 2.8	+21 45.5	13 24.6	+ 5 56.4	-0.8206	0.5624	+0.0652	-10	-69
A² Tauri	6	2.09	2.5	21 41.4	13 41 3	+ 6 12.6	-0.7302	0.5624	0.0646	- 4	-69
ω² Tauri	5½	2.14	1.8	20 17.2	19 0.4	+11 20.6	+1.0852	0.5623	0.0539	+90	+44
53 Tauri	6	2.16	1.9	20 51.4	19 57.2	-11 44.6	+0.5271	0.5623	0.0519	+75	+ 8
56 Tauri	6	2.18	2.0	21 29.2	20 1.1	-11 40.9	-0.1458	0.5623	0.0517	+30	-28
B. A. C. 1342	6½	+2.18	+ 1.7	+20 32.3	21 16.0	-10 28.6	+0.9342	0.5622	+0.0492	+90	+33
κ¹ Tauri	5½	2.21	1.8	22 1.4	22 33.1	- 9 14.2	-0.5953	0.5621	0.0467	+ 4	-57
κ² Tauri	6½	2.21	1.8	21 55.8	22 34.5	- 9 12.7	-0.4938	0.5621	0.0466	+10	-50
υ¹ Tauri	4½	2.22	1.9	22 32.7	22 57.4	- 8 50.7	-1.1366	0.5621	0.0458	-36	-68
B. A. C. 1373	6½	2.22	1.4	21 21.3	23 44.3	- 8 5.4	+0.1738	0.5621	0.0441	+49	-10
Rumker 1250	6½	+2.31	+ 1.0	+22 42.9	28 6 0.5	- 2 2.3	-1.0503	0.5617	+0.0314	-28	-68
τ Tauri	4½	2.31	1.0	22 43.8	6 1.6	- 2 1.2	-1.0659	0.5617	0.0313	-29	-68
Yarnall 1997	6½	2.33	1.0	22 43.3	6 45.7	- 1 18.6	-1.0354	0.5616	0.0298	-26	-68
ι Tauri	5	2.39	+ 0.4	21 25.2	15 20.0	+ 6 57.9	+0.5482	0.5606	0.0122	+77	+13
105 Tauri	6	2.43	- 0.7	21 32.8	17 29.5	+ 9 2.9	+0.4327	0.5603	+0.0079	+67	+ 7
n Tauri	6	+2.48	- 1.2	+21 58.4	22 33.9	-10 3.1	-0.0148	0.5594	-0.0025	+37	-16
o Tauri	6	2.51	1.8	21 50.0	29 2 19.5	- 6 25.4	+0.1130	0.5587	0.0102	+45	-10
ζ Tauri	3½	2.54	2.5	21 4.1	6 51.3	- 2 2.8	+0.8790	0.5578	0.0191	+90	+33
B. A C. 1835	6½	2.57	3.4	20 49.5	11 43.0	+ 2 38.9	+1.0287	0.5568	0.0288	+90	+42
141 Tauri	6	2.64	3.8	22 23.7	17 44.7	+ 8 28.4	-0.8907	0.5553	0.0406	-15	-68
B. A. C. 1970	6½	+2.67	- 4.2	+22 12.4	21 20.5	+11 56.8	-0.8457	0.5543	-0.0476	-12	-68
B. A. C. 2039	6½	2.68	5.2	21 15.0	30 2 48.5	- 6 46.1	-0.0875	0.5526	0.0578	+33	-26
15 Geminorum	6	2.69	5.7	20 51.5	5 47.1	- 3 53.4	+0.1597	0.5516	0.0633	+48	-13
16 Geminorum	6	2.68	5.8	20 33.9	5 52.2	- 3 48.5	+0.4751	0.5515	0.0635	+70	+ 4
ν Geminorum	4½	2.68	5.8	20 17.0	6 20.8	- 3 20.8	+0.7513	0.5512	0.0644	+90	+20
ζ Geminorum	4	+2.78	- 8.0	+20 44.4	22 49.7	-11 24.4	-1.0500	0.5454	-0.0934	-27	-70
B. A. C. 2432	6½	2.77	9.5	18 29.7	31 7 57.3	- 2 34.4	+0.4995	0.5417	0.1081	+72	+ 1
f Geminorum	6	2.77	10.5	17 56.3	15 54.8	+ 5 8.0	+0.2043	0.5386	0.1203	+50	-16
g Geminorum	5½	+2.79	-10.6	+18 47.6	19 9.0	+ 8 16.1	-1.1366	0.5373	-0.1250	-34	-71

FEBRUARY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
1 Cancri	6	+2.76	-11.6	+16 6.1	1 0 33.4	-10 29.6	+1.1424	0.5352	-0.1396	+90	+41
3 Cancri	6	2.78	11.6	17 37.6	2 24.2	- 8 42.3	-0.7925	0.5345	0.1351	- 7	-73
5 Cancri	6	2.78	11.7	16 46.6	2 46.6	- 8 20.5	+0.0983	0.5343	0.1356	+44	-24
B. A. C. 2731	6½	+2.79	-11.9	+17 21.5	7 0.1	- 4 14.8	-1.1308	0.5328	-0.1411	-32	-73
29 Cancri	6	2.77	13.1	14 35.8	16 25.6	+ 4 53.3	+0.5417	0.5287	0.1528	+74	- 2
B. A. C. 2872	6½	2.76	13.4	13 39.4	19 3.1	+ 7 26.4	+1.1792	0.5277	0.1556	+90	+42
A¹ Cancri	6	2.75	13.8	13 6.0	23 53.5	-11 52.0	+1.0317	0.5257	0.1610	+90	+27
60 Cancri	6	2.74	13.4	12 4.3	2 6 27.8	- 5 29.5	+1.0914	0.5231	0.1677	+90	+31
α Cancri	4	+2.73	-14.4	+12 18.6	7 47.0	- 4 12.7	+0.6060	0.5227	-0.1690	+80	0
κ Cancri	5	+2.72	-14.6	+11 8.3	12 37.5	+ 0 29.3	+1.0780	0.5209	-0.1734	+90	+29

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 3122	6½	+2.71	-14.5	+12 2.4	2 13 40.2	+ 1 30.2	-0.1083	0.5205	-0.1743	+32	-40
ω Leonis	6	2.69	15.2	9 33.9	23 31.8	+11 4.6	+0.8843	0.5175	0.1824	+90	+14
h Leonis	6	2.68	15.3	10 13.9	3 1 22.7	-11 7.7	-0.1940	0.5170	0.1837	+27	-46
o Leonis	3½	2.68	15.6	10 25.4	6 16.2	- 6 22.6	-1.3161	0.5156	0.1871	-52	-80
B. A. C. 3407	6	2.65	15.8	8 52.3	15 22.2	+ 2 27.9	-1.3189	0.5134	0.1926	-52	-81
π Leonis	5	+2.64	-16.0	+ 8 36.3	16 29.9	+ 3 33.7	-1.2405	0.5131	-0.1932	-40	-82
14 Sextantis	6	2.62	16.0	6 10.9	20 4.4	+ 7 2.0	+0.7603	0.5123	0.1950	+90	+ 5
16 Sextantis	6	2.61	15.9	6 44.7	21 23.5	+ 8 19.0	-0.1220	0.5121	0.1957	+31	-44
19 Sextantis	6½	2.60	15.9	5 11.6	23 20.0	+10 12.2	+1.2218	0.5117	0.1966	+90	+39
Yarnall 4339	6½	2.57	15.9	4 31.7	4 6 45.0	- 6 35.2	+0.4923	0.5105	0.1995	+69	-11
34 Sextantis	6	+2.54	-15.8	+ 4 11.7	15 32.5	+ 1 57.5	-0.9018	0.5094	-0.2021	-12	-86
36 Sextantis	6	2.53	15.9	3 6.2	16 55.6	+ 3 18.3	+0.0300	0.5093	0.2024	+40	-36
B. A. C. 3726	6	2.52	15.7	1 38.8	20 47.4	+ 7 3.7	+0.8656	0.5089	0.2032	+90	+10
55 Leonis	6	2.51	15.7	1 21.7	22 40.9	+ 8 54.0	+0.7984	0.5089	0.2034	+90	+ 6
B. A. C. 3779	6	2.50	15.5	0 6.6	5 2 43.3	-11 10.4	+1.3655	0.5087	0.2039	+90	+62
p^2 Leonis	6	+2.50	-15.5	+ 0 37.8	3 0.5	-10 53.7	+0.7286	0.5087	-0.2040	+90	+ 2
p^5 Leonis	5	2.46	15.4	+ 0 34.1	8 32.9	- 5 30.6	-0.3326	0.5087	0.2043	+20	-58
B. A. C. 3901	6	2.42	15.1	- 1 3.3	16 15.6	+ 1 59.3	-0.1059	0.5090	0.2040	+32	-43
B. A. C. 3903	6½	2.42	15.2	0 15.1	16 20.3	+ 2 3.8	-1.0123	0.5090	0.2040	-10	-90
B. A. C. 3909	6	2.41	15.2	0 12.2	17 4.4	+ 2 46.7	-1.2165	0.5091	0.2039	-37	-90
e Leonis	4½	+2.43	-14.9	- 2 21.4	17 34.3	+ 3 15.8	+1.0691	0.5091	-0.2038	+88	+25
B. A. C. 3955	5½	2.40	14.8	1 47.3	21 57.9	+ 7 32.1	-0.4565	0.5095	0.2033	+13	-66
B. A. C. 4006	6	2.37	14.1	4 40.9	6 4 48.9	- 9 48.4	+1.3574	0.5103	0.2020	+86	+59
B. A. C. 4201	6½	2.27	12.7	8 1.5	7 0 35.0	+ 9 24.0	+1.1105	0.5148	0.1949	+82	+28
χ Virginis	5	2.23	12.5	7 21.0	6 32.5	- 8 48.8	-0.7857	0.5167	0.1918	- 7	-90
B. A. C. 4259	6	+2.23	-12.5	- 7 23.2	6 37.1	- 8 44.3	-0.7593	0.5167	-0.1917	- 5	-90
B. A. C. 4312	6½	2.20	11.3	9 42.0	12 52.6	- 2 39.7	+0.5921	0.5189	0.1879	+73	- 6
ψ Virginis	5	2.18	11.6	8 54.1	14 25.8	- 1 9.3	-0.5750	0.5195	0.1868	+ 5	-76
g Virginis	6	2.14	10.9	10 6.7	21 24.9	+ 5 37.5	-0.5353	0.5199	0.1819	+ 6	-73
50 Virginis	6	2.14	10.9	9 42.1	22 22.4	+ 6 33.3	-1.1574	0.5227	0.1812	-35	-90
i Virginis	5½	+2.08	- 9.8	-12 5.8	8 6 59.4	- 9 5.1	-0.0730	0.5267	-0.1739	+30	-42
B. A. C. 4531	6	2.06	9.3	12 36.7	10 58.8	- 5 13.0	-0.1974	0.5288	0.1702	+22	-50
B. A. C. 4679	6½	1.96	7.3	14 24.3	9 1 38.0	+ 8 58.9	-0.6317	0.5370	0.1545	- 3	-84
B. A. C. 4700	5½	1.94	7.0	15 44.8	4 41.7	+11 56.7	+0.3490	0.5388	0.1507	+50	-19
B. A. C. 4896	6	1.77	4.8	17 18.0	23 51.3	+ 6 28.8	-0.6241	0.5509	0.1241	- 7	-84
ι^1 Libræ	4½	+1.70	- 3.4	-19 20.7	10 9 13.0	- 8 28.3	+0.4614	0.5570	-0.1091	+53	-12
ι^2 Libræ	6	1.69	3.4	19 12.2	9 42.9	- 7 59.5	+0.2564	0.5573	0.1083	+41	- 4
Yarnall 6277	6½	1.68	2.9	20 17.3	11 43.4	- 6 3.1	+1.1929	0.5587	0.1049	+70	+41
B. A. C. 5109	6½	1.60	2.6	19 16.1	18 17.6	+ 0 17.3	-0.5403	0.5631	0.0934	- 5	-75
41 Libræ	6	1.57	2.3	18 54.8	21 3.5	+ 2 57.5	-1.1647	0.5650	0.0882	-49	-90
κ Libræ	5	+1.56	- 2.1	-19 17.7	22 23.3	+ 4 14.3	-0.8754	0.5658	-0.0857	-26	-90
λ Libræ	6	1.50	1.6	19 48.8	11 3 19.0	+ 8 59.7	-0.7268	0.5690	0.0763	-18	-90
B. A. C. 5278	6	1.49	1.0	21 8.5	4 57.5	+10 34.8	+0.5449	0.5701	0.0730	+56	- 7
B. A. C. 5281	6	1.49	1.3	20 38.4	5 10.1	+10 46.8	+0.0037	0.5702	0.0726	+22	-39
ω^1 Scorpii	4½	1.43	1.0	20 20.9	9 4.9	- 9 26.9	-0.5701	0.5727	0.0647	-10	-79
ω^2 Scorpii	5	+1.43	- 1.0	-20 32.9	9 19.8	- 9 12.5	-0.3759	0.5729	-0.0645	+ 1	-62
B. A. C. 5395	6	1.41	- 0.6	21 5.8	11 59.4	- 6 38.8	+0.0343	0.5745	0.0587	+22	-36
ω Ophiuchi	5	1.31	+ 0.2	21 12.8	19 44.3	+ 0 49.0	-0.2365	0.5789	0.0438	+ 6	-52
24 Ophiuchi	6½	1.20	1.7	22 57.7	12 5 53.3	+10 35.1	+1.2578	0.5847	0.0195	+67	+57
B. A. C. 5758	6	1.13	1.5	21 24.0	9 45.4	- 9 41.7	-0.4118	0.5866	0.0105	- 6	-65
Yarnall 7137	6½	+1.08	+ 1.5	-20 49.8	13 17.7	- 6 17.5	-1.0179	0.5886	-0.0024	-44	-90
ξ Ophiuchi	5	1.05	1.8	20 59.0	15 45.1	- 3 55.8	-0.8574	0.5893	+0.0035	-33	-90
B. A. C. 5866	6	1.03	2.0	21 19.7	17 14.7	- 2 29.7	-0.4954	0.5899	0.0071	-10	-72
B. A. C. 5954	6	0.97	2.4	21 50.4	22 52.6	+ 2 55.2	+0.1054	0.5921	0.0204	+23	-32
58 Ophiuchi	5	0.95	2.4	21 37.4	13 0 45.3	+ 4 43.6	-0.0736	0.5928	0.0250	+13	-42
B. A. C. 5992	6½	+0.95	+ 2.5	-22 8.4	1 7.4	+ 5 4.8	+0.4618	0.5929	+0.0259	+46	-12
B. A. C. 6081	6	+0.87	+ 2.7	-20 19.7	7 22.3	+11 5.1	-1.1695	0.5948	+0.0409	-54	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
B. A. C. 6098	6	+0.85	+ 2.7	-20 44.1	13 8 24.1	-11 55.6	-0.7126	0.5951	+0.0434	-20	-90
Yarnall 7631	6½	0.83	3.0	21 27.2	10 11.8	-10 12.1	+0.0982	0.5955	0.0478	+25	-32
μ Sagittarii	4½	0.80	3.1	21 6.2	12 48.3	- 7 41.8	-0.1395	0.5961	0.0540	+12	-46
14 Sagittarii	6	0.80	3.3	21 44.5	12 59.5	- 7 31.0	+0.5321	0.5961	0.0544	+53	- 8
15 Sagittarii	5	0.79	3.1	20 45.7	13 23.1	- 7 8.4	-0.4375	0.5962	0.0555	- 3	-67
16 Sagittarii	6	+0.79	+ 3.0	-20 25.3	13 23.7	- 7 7.8	-0.7805	0.5962	+0.0555	-23	-90
21 Sagittarii	5	0.75	3.2	20 36.1	17 23.4	- 3 17.5	-0.3550	0.5970	0.0652	+ 2	-60
B. A. C. 6336	6½	0.71	3.7	21 29.5	22 19.1	+ 1 26.4	+0.8905	0.5977	0.0774	+69	+15
B. A. C. 6347	6½	0.69	3.6	21 9.0	22 43.1	+ 1 49.5	+0.5776	0.5977	0.0779	+58	- 5
Yarnall 7918	6	0.66	3.3	19 23.7	14 0 20.0	+ 3 22.5	-1.0561	0.5979	0.0817	-40	-90
Yarnall 7942	6	+0.64	+ 3.4	-19 43.6	1 32.8	+ 4 32.4	-0.6213	0.5980	+0.0847	-11	-84
Yarnall 7955	6	0.64	3.6	20 24.0	2 15.7	+ 5 13.6	+0.1147	0.5980	0.0863	+29	-31
29 Sagittarii	6	0.63	3.6	20 27.4	2 58.0	+ 5 54.2	+0.2326	0.5981	0.0880	+36	-25
ξ^1 Sagittarii	6	0.60	3.7	20 48.5	5 58.7	+ 8 47.8	+0.8592	0.5983	0.0950	+69	+12
Yarnall 8035	6½	0.59	3.5	19 18.3	6 6.4	+ 8 55.1	-0.6314	0.5983	0.0953	-11	-85
Yarnall 8087	6½	+0.57	+ 3.9	-19 23.6	8 15.3	+10 59.0	-0.3325	0.5983	+0.1003	+ 6	-59
Yarnall 8088	6	0.57	3.5	19 16.2	8 16.7	+11 0.3	-0.4531	0.5983	0.1004	0	-68
Yarnall 8122	6½	0.55	3.5	18 55.0	9 52.1	-11 28.0	-0.6434	0.5984	0.1041	-11	-86
B. A. C. 6536	6	0.55	3.6	19 28.4	10 18.3	-11 3.0	-0.0427	0.5984	0.1050	+22	-41
d Sagittarii	5	0.51	3.6	19 9.6	13 59.6	- 7 30.6	+0.0484	0.5983	0.1134	+28	-35
Yarnall 8261	6½	+0.50	+ 3.7	-19 27.2	15 33.3	- 6 0.4	+0.5188	0.5982	+0.1168	+57	- 9
ρ^1 Sagittarii	4	0.49	3.4	18 4.0	15 36.2	- 5 57.6	-0.8539	0.5982	0.1169	-22	-90
ρ^2 Sagittarii	5½	0.49	3.5	18 31.5	15 39.5	- 5 54.5	-0.3922	0.5982	0.1171	+ 5	-63
B. A. C. 6658	6	0.47	3.6	18 35.7	18 7.1	- 3 32.7	-0.0273	0.5981	0.1226	+25	-39
Yarnall 8347	6½	0.46	3.8	19 37.9	19 31.5	- 2 11.6	+1.1757	0.5980	0.1227	+71	+39
g Sagittarii	5½	+0.36	+ 3.4	-15 48.2	15 5 58.1	+ 7 50.2	-1.1893	0.5967	+0.1472	-45	-90
B. A C. 6992	6½	0.30	3.4	15 9.2	15 3.2	- 7 26.1	-0.4069	0.5948	0.1645	+ 9	-63
β Capricorni	3	0.30	3.4	15 9.1	15 8.8	- 7 20.7	-0.3950	0.5948	0.1647	+ 9	-63
B. A. C. 7063	6	0.29	3.5	15 26.9	19 10.2	- 3 28.7	+0.5736	0.5940	0.1718	+66	- 6
B. A. C. 7087	5	0.27	3.4	14 7.5	20 26.1	- 2 15.7	-0.5076	0.5935	0.1740	+ 4	-71
τ^1 Capricorni	6	+0.27	+ 3.6	-15 33.2	21 40.8	- 1 3.9	+1.1133	0.5932	+0.1761	+75	+30
τ^2 Capricorni	5	0.27	3.6	-15 22.0	22 27.4	- 0 19.2	+1.0993	0.5930	0.1773	+75	+29
				NEW	*MOON.*						
κ Piscium	4½	0.26	3.0	+ 0 36.6	18 20 13.6	- 5 9.7	+0.3806	0.5746	0.2292	+61	-17
16 Piscium	6	+0.29	+ 3.0	+ 1 26.9	19 0 17.0	- 1 15.2	+0.4855	0.5739	+0.2281	+68	-12
19 Piscium	6	0.32	3.1	2 50.0	4 34.0	+ 2 52.5	+0.0829	0.5731	0.2265	+43	-33
22 Piscium	6½	0.33	2.9	2 16.5	6 57.3	+ 5 10.7	+1.1869	0.5728	0.2255	+90	+34
d Piscium	5½	0.43	3.5	7 32.2	19 16.2	- 6 57.0	-1.2814	0.5715	0.2180	-45	-83
45 Piscium	6	0.44	3.4	7 2.4	21 27.8	- 4 50.1	-0.3136	0.5713	0.2163	+21	-55
51 Piscium	6½	+0.45	+ 3.3	+ 6 18.3	20 0 21.2	- 2 2.9	+1.0385	0.5710	+0.2138	+90	+23
Yarnall 585	6½	0.61	3.5	9 16.8	15 51.8	-11 5.7	+1.2744	0.5704	0.1977	+90	+48
101 Piscium	6	0.77	3.9	14 3.5	21 3 39.3	+ 0 16.4	-1.2969	0.5702	0.1822	-52	-76
104 Piscium	6½	0.79	3.8	13 41.3	5 9.4	+ 1 43.4	-0.6506	0.5702	0.1802	+ 2	-74
19 Arietis	6	0.96	3.5	14 43.6	19 42.7	- 8 14.6	+0.7551	0.5702	0.1576	+90	+11
27 Arietis	6	+1.08	+ 3.7	+17 11.0	22 3 22.5	- 0 51.3	-0.6036	0.5701	+0.1446	+ 4	-66
40 Arietis	6½	1.17	3.3	17 47.5	10 57.5	+ 6 27.4	-0.1897	0.5699	0.1309	+27	-38
π Arietis	6	1.18	3.2	16 58.4	11 17.9	+ 6 47.1	+0.7001	0.5698	0.1302	+90	+10
ρ^2 Arietis	6	1.21	3.1	17 51.2	14 5.6	+ 9 28.8	+0.1475	0.5698	0.1250	+46	-19
ρ^3 Arietis	6	1.22	3.1	17 33.2	14 21.0	+ 9 43.6	+0.4914	0.5698	0.1245	+71	0
53 Arietis	6	+1.28	+ 2.7	+17 25.5	19 6.4	- 9 41.2	+1.1981	0.5696	+0.1154	+90	+49
54 Arietis	6½	1.29	2.9	18 20.5	19 29.1	- 9 19.4	+0.2886	0.5696	0.1147	+55	-10
δ Arietis	4½	1.32	3.2	19 16.8	20 52.6	- 7 58.8	-0.5289	0.5695	0.1119	+ 8	-58
B. A. C. 1032	6½	1.38	2.8	20 4.9	23 0 51.1	- 4 8.9	-0.9356	0.5694	0.1042	-18	-70
τ^2 Arietis	5½	1.40	2.8	20 19.2	1 40.1	- 3 21.7	-1.0995	0.5694	0.1026	-31	-70
65 Arietis	6	+1.40	+ 2.9	+20 23.1	2 23.4	- 2 40.0	-1.0942	0.5693	+0.1011	-31	-70
13 Tauri	6½	+1.49	+ 2.1	+19 19.3	10 7.8	+ 4 47.9	+0.7411	0.5687	+0.0858	+90	+18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
B. A. C. 1143	6½	+1.51	+ 2.4	+20 33.2	23 11 2.2	+ 5 42.0	−0.4756	0.5687	+0.0854	+11	−52
B. A. C. 1242	6½	1.61	1.7	19 52.1	18 15.5	−11 21.9	+0.8010	0.5678	0.0690	+90	+23
A^1 Tauri	5	1.65	2.0	21 45.5	19 46.3	− 9 54.2	−1.0922	0.5676	0.0661	−32	−69
A^2 Tauri	6	1.65	1.6	21 41.4	20 2.7	− 9 38.5	−1.0016	0.5675	0.0656	−24	−69
ω^2 Tauri	5½	1.71	0.9	20 17.2	24 1 16.3	− 4 36.0	+0.7956	0.5667	0.0548	+90	+24
53 Tauri	6	+1.72	+ 0.9	+20 51.3	2 12.1	− 3 42.2	+0.2435	0.5666	+0.0528	+53	− 7
56 Tauri	6	1.73	1.2	21 29.2	2 16.0	− 3 38.5	−0.4222	0.5666	0.0527	+14	−45
Rumker 1169	6½	1.75	0.9	20 55.9	3 50.0	− 2 7.7	+0.2464	0.5664	0.0495	+53	− 6
κ^1 Tauri	5½	1.78	1.1	22 1.4	4 45.6	− 1 14.2	−0.8666	0.5661	0.0475	−13	−68
κ^2 Tauri	6½	1.78	0.8	21 55.7	4 47.0	− 1 12.8	−0.7660	0.5661	0.0474	− 7	−68
B. A. C. 1373	6½	+1.79	+ 0.8	+21 21.3	5 55.8	− 0 6.4	−0.1042	0.5659	+0.0452	+32	−25
ι Tauri	5	1.97	− 1.3	21 25.2	21 20.3	− 9 14.5	+0.2774	0.5626	0.0133	+55	− 1
105 Tauri	6	1.99	1.1	21 32.8	23 28.5	− 7 10.7	+0.1645	0.5621	+0.0089	+48	− 7
n Tauri	6	2.07	1.5	21 58.4	25 4 30.5	− 2 19.1	−0.2753	0.5608	−0.0015	+22	−31
o Tauri	6	2.11	2.3	21 50.0	8 14.5	+ 1 17.1	−0.1452	0.5594	0.0015	+29	−24
ζ Tauri	3½	+2.16	− 2.7	+21 4.1	12 44.9	+ 5 38.2	+0.6212	0.5583	−0.0181	+85	+17
B. A. C. 1835	6½	2.20	3.3	20 49.5	17 35.4	+10 18.7	+0.7755	0.5570	0.0268	+90	+25
141 Tauri	6	2.30	3.6	22 23.7	23 36.1	− 7 52.8	−1.1280	0.5548	0.0392	−36	−68
B. A. C. 1970	6½	2.33	4.1	22 12.4	26 3 11.4	− 4 24.8	−1.0792	0.5535	0.0460	−31	−68
B. A. C. 2039	6½	2.37	5.1	21 15.0	8 39.3	+ 0 52.2	−0.3174	0.5514	0.0562	+20	−39
15 Geminorum	6	+2.39	− 5.7	+20 51.4	11 37.9	+ 3 44.8	−0.0637	0.5502	−0.0616	+34	−24
16 Geminorum	6	2.38	5.7	20 34.0	11 43.0	+ 3 49.7	+0.2496	0.5502	0.0618	+53	− 8
ν Geminorum	4½	2.39	5.8	20 17.0	12 11.6	+ 4 17.3	+0.5268	0.5499	0.0634	+74	+ 7
ζ Geminorum	4	2.55	7.6	20 44.4	27 4 42.5	− 3 44.2	−1.2497	0.5438	0.0913	−51	−70
B. A. C. 2432	6½	2.58	9.2	18 29.7	13 51.9	+ 5 7.6	+0.3139	0.5400	0.1058	+57	− 9
Lalande 14620	6	+2.59	− 9.8	+17 19.5	18 7.3	+ 9 15.0	+1.1405	0.5381	−0.1124	+90	+43
f Geminorum	6	2.63	10.0	17 56.4	21 51.4	−11 8.0	+0.0331	0.5365	0.1178	+40	−25
g Geminorum	5½	2.66	10.2	18 47.7	28 1 6.4	− 7 59.1	−1.3011	0.5353	0.1224	−62	−71
1 Cancri	6	2.64	11.2	16 6.1	6 32.3	− 2 43.3	+0.9881	0.5333	0.1294	+90	+28
3 Cancri	6	2.67	11.2	17 37.6	8 23.5	− 0 55.6	−0.9430	0.5324	0.1324	−17	−73
5 Cancri	6	+2.66	−11.4	+16 46.6	8 46.1	− 0 33.6	−0.0516	0.5322	−0.1329	+35	−32
B. A. C. 2731	6½	2.70	11.7	17 21.5	13 0.7	+ 3 33.2	−1.2723	0.5306	0.1383	−51	−73
Yarnall 3362	6½	2.70	12.8	15 8.3	19 4.7	+ 9 26.1	+0.3220	0.5282	0.1459	+57	−13
29 Cancri	6	+2.70	−13.2	+14 35.8	22 28.5	−11 16.3	+0.4204	0.5271	−0.1500	+64	− 8

MARCH.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
B. A. C. 2872	6½	+2.70	−13.6	+13 39.4	1 1 6.6	− 8 42.7	+1.0637	0.5261	−0.1529	+90	+31
A^1 Cancri	6	2.72	14.2	13 5.9	5 58.0	− 4 0.1	+0.9270	0.5244	0.1583	+90	+20
A^2 Cancri	6	2.72	14.5	12 32.3	7 54.1	− 2 7.5	+1.2419	0.5238	0.1602	+90	+47
60 Cancri	6	2.73	14.9	12 4.3	12 33.6	+ 2 23.8	+1.0028	0.5222	0.1650	+90	+25
α Cancri	4	2.74	15.0	12 18.6	13 53.0	+ 3 40.8	+0.5194	0.5218	0.1663	+72	− 5
κ Cancri	5	+2.75	−15.5	+11 8.3	18 44.2	+ 8 23.5	+1.0035	0.5202	−0.1708	+90	+24
B. A. C. 3122	6½	2.75	15.5	12 2.4	19 48.0	+ 9 25.5	−0.1806	0.5199	0.1717	+28	−44
ω Leonis	6	2.78	16.5	9 33.9	2 5 39.5	− 5 0.2	+0.8362	0.5173	0.1750	+90	+12
k Leonis	6	2.79	16.7	10 13.8	7 30.5	− 3 12.4	−0.2375	0.5169	0.1811	+25	−48
o Leonis	3½	2.80	16.7	10 25.4	12 24.1	+ 1 32.8	−1.3480	0.5157	0.1803	−63	−80
B. A. C. 3407	6	+2.80	−17.3	+ 8 52.3	21 29.8	+10 23.0	−1.3277	0.5139	−0.1904	−54	−81
π Leonis	5	2.80	17.4	8 36.3	22 37.4	+11 28.7	−1.2459	0.5138	0.1910	−41	−82
14 Sextantis	6	2.79	17.7	6 10.9	3 2 11.6	− 9 3.3	+0.7638	0.5131	0.1929	+90	+ 5
16 Sextantis	6	2.79	17.8	6 44.6	3 30.5	− 7 46.6	−0.1155	0.5130	0.1935	+31	−43
Yarnall 4339	6½	2.80	18.1	4 31.6	12 50.7	+ 1 17.9	+0.5235	0.5119	0.1975	+72	− 9
34 Sextantis	6	+2.80	−18.2	+ 4 11.6	21 36.1	+ 9 48.5	−0.8484	0.5112	−0.2002	− 9	−86
36 Sextantis	6	2.80	18.4	3 6.2	22 59.0	+11 9.1	+0.0864	0.5111	0.2006	+43	−33
B. A. C. 3726	6	2.80	18.6	1 38.8	4 2 49.7	− 9 6.6	+0.9319	0.5111	0.2014	+90	+15
55 Leonis	6	2.80	18.4	1 21.6	4 42.7	− 7 16.8	+0.8690	0.5110	0.2017	+90	+11
p^2 Leonis	6	+2.81	−18.3	+ 0 37.8	9 1.1	− 3 5.6	+0.8104	0.5110	−0.2023	+90	+ 7

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
p^5 Leonis	5	+2.81	-18.4	+ 0 34.0	4 14 31.6	+ 2 15.6	-0.2363	0.5113	-0.2027	+25	-51
B. A. C. 3901	6	2.80	18.3	- 1 3.3	22 11.4	+ 9 42.6	+0.0083	0.5119	0.2025	+38	-37
B. A. C. 3903	6½	2.80	18.3	0 15.2	22 16.3	+ 9 47.3	-0.8974	0.5119	0.2026	-12	-90
B. A. C. 3909	6	2.79	18.4	0 12.3	23 0.1	+10 29.9	-1.0993	0.5120	0.2026	-27	-90
e Leonis	4½	2.81	18.2	2 21.5	23 29.8	+10 58.8	+1.1858	0.5120	0.2023	+88	+34
B. A. C. 3955	5½	+2.79	-18.2	- 1 47.3	5 3 51.8	- 8 46.6	-0.3287	0.5125	-0.2021	+20	-57
B. A. C. 4201	6½	2.79	16.7	8 1.6	6 6 19.2	- 7 4.3	+1.2969	0.5182	0.1939	+82	+48
χ Virginis	5	2.78	16.5	7 21.0	12 15.0	- 1 18.8	-0.5691	0.5198	0.1908	+ 4	-77
B. A. C. 4259	6	2.78	16.4	7 23.3	12 19.6	- 1 14.3	-0.5626	0.5198	0.1908	+ 6	-75
B. A. C. 4312	6½	2.76	15.7	9 42.1	18 33.5	+ 4 48.6	+0.8015	0.5218	0.1870	+81	+ 7
ψ Virginis	5	+2.76	-15.8	- 8 54.1	20 6.3	+ 6 18.6	-0.3637	0.5223	-0.1860	+16	-60
g Virginis	6	2.75	15.0	10 6.8	7 3 4.2	-10 55.9	-0.3132	0.5248	0.1810	+18	-57
50 Virginis	6	2.74	15.0	9 42.2	4 1.5	-10 0.2	-0.9345	0.5253	0.1802	-18	-90
i Virginis	5½	2.73	13.9	12 5.8	12 37.7	- 1 39.5	+0.1654	0.5280	0.1747	+43	-29
B. A. C. 4531	6	2.72	13.5	12 36.8	16 37.2	+ 2 12.7	+0.0458	0.5306	0.1691	+35	-35
B. A. C. 4679	6½	+2.66	-11.4	-14 24.4	8 7 18.1	- 7 33.6	-0.3713	0.5375	-0.1533	+11	-61
B. A. C. 4700	5½	2.65	11.1	15 44.8	10 23.0	- 4 34.5	+0.6163	0.5390	0.1496	+70	- 4
B. A. C. 4896	6	2.56	8.5	17 18.1	9 5 42.3	- 9 42.8	-0.3477	0.5498	0.1214	+ 9	-60
ι^1 Libræ	4½	2.51	6.9	19 20.8	15 11.5	- 0 42.4	+0.7514	0.5544	0.1080	+71	+ 5
ι^2 Libræ	6	2.51	6.9	19 12.2	15 41.8	- 0 13.1	+0.5265	0.5547	0.1072	+59	- 8
B. A. C. 5109	6½	+2.42	- 5.8	-19 16.1	10 0 25.2	+ 8 12.4	-0.2561	0.5593	-0.0921	+10	-53
41 Libræ	6	2.39	5.3	18 54.8	3 14.3	+10 55.7	-0.8874	0.5607	0.0871	-27	-90
κ Libræ	5	2.39	5.1	19 17.8	4 34.6	-11 46.8	-0.5934	0.5614	0.0847	- 9	-81
λ Libræ	6	2.35	4.4	19 48.9	9 37.5	- 6 54.4	-0.4447	0.5640	0.0752	- 2	-67
B. A. C. 5278	6	2.35	3.8	21 8.5	11 18.3	- 5 17.1	+0.8416	0.5648	0.0720	+69	+12
B. A. C. 5281	6	+2.34	- 4.0	-20 38.4	11 31.1	- 5 4.8	+0.2940	0.5650	-0.0716	+39	-21
β^1 Scorpii	2	2.28	3.8	19 28.9	14 56.5	- 1 46.6	-1.1676	0.5666	0.0650	-51	-90
β^2 Scorpii	5½	2.28	3.8	19 28.8	14 56.6	- 1 46.5	-1.1708	0.5666	0.0650	-52	-90
ω^1 Scorpii	4½	2.29	3.4	20 20.9	15 31.4	- 1 12.9	-0.2867	0.5669	0.0639	+ 6	-55
ω^2 Scorpii	5	2.30	3.4	20 33.0	15 46.6	- 0 58.3	-0.0903	0.5670	0.0634	+16	-43
B. A. C. 5395	6	+2.27	- 2.9	-21 5.9	18 30.1	+ 1 39.4	+0.3246	0.5683	-0.0580	+40	-19
ω Ophiuchi	5	2.19	1.7	21 12.8	11 2 27.3	+ 9 19.5	+0.0491	0.5720	0.0417	+21	-35
B. A. C. 5567	6	2.13	- 1.7	20 10.7	6 4.7	-11 11.0	-1.1763	0.5737	0.0341	-55	-90
B. A. C. 5758	6	2.01	0.0	21 24.0	16 53.7	- 0 45.7	-0.1353	0.5778	0.0107	+ 8	-46
Yarnall 7137	6½	1.97	+ 0.3	20 49.8	20 32.9	+ 2 45.4	-0.7529	0.5791	-0.0031	-26	-90
ξ Ophiuchi	5	+1.93	+ 0.8	-20 59.1	23 5.2	+ 5 12.0	-0.5917	0.5800	+0.0030	-16	-81
B. A. C. 5866	6	1.91	1.2	21 19.8	12 0 37.8	+ 6 41.1	-0.2251	0.5804	0.0065	+ 4	-51
B. A. C. 5954	6	1.84	1.7	21 50.4	6 27.4	-11 42.3	+0.3811	0.5821	0.0195	+39	-16
58 Ophiuchi	5	1.81	1.8	21 37.4	8 24.2	- 9 49.9	+0.1977	0.5826	0.0239	+28	-26
B. A. C. 5992	6½	1.81	2.0	22 8.4	8 47.1	- 9 27.8	+0.7415	0.5827	0.0248	+68	+ 5
B. A. C. 6081	6	+1.70	+ 2.1	-20 19.7	15 15.5	- 3 14.1	-0.9228	0.5841	+0.0393	-34	-90
B. A. C. 6098	6	1.69	2.4	20 44.1	16 19.7	- 2 12.3	-0.4592	0.5844	0.0418	- 6	-69
Yarnall 7631	6½	1.68	2.7	21 27.2	18 11.4	- 0 24.8	+0.3633	0.5848	0.0469	+41	-17
μ Sagittarii	4½	1.64	2.9	21 5.2	20 53.8	+ 2 11.5	+0.1185	0.5851	0.0521	+26	-41
14 Sagittarii	6	1.64	3.1	21 44.5	21 5.3	+ 2 22.5	+0.8017	0.5852	0.0525	+69	+ 9
15 Sagittarii	5	+1.62	+ 2.9	-20 45.7	21 29.9	+ 2 46.2	-0.1853	0.5852	+0.0534	+10	-49
16 Sagittarii	6	1.62	2.8	20 25.3	21 30.4	+ 2 46.7	-0.5337	0.5852	0.0534	- 9	-75
21 Sagittarii	5	1.57	3.0	20 36.1	13 1 39.2	+ 6 46.1	-0.1059	0.5859	0.0629	+15	-44
B. A. C. 6336	6½	1.50	4.0	21 29.5	6 46.3	+11 41.5	+1.1545	0.5864	0.0743	+69	+38
B. A. C. 6347	6½	1.50	3.8	21 9.0	7 11.2	-11 54.6	+0.8360	0.5864	0.0753	+69	+11
Yarnall 7918	6	+1.46	+ 3.4	-19 23.7	8 51.8	-10 17.8	-0.8281	0.5866	+0.0789	-23	-90
Yarnall 7942	6	1.45	3.6	19 43.6	10 7.4	- 9 5.1	-0.3874	0.5867	0.0817	+ 2	-62
Yarnall 7955	6	1.43	3.8	20 24.0	10 52.0	- 8 22.2	+0.3605	0.5867	0.0833	+44	-17
29 Sagittarii	6	1.43	3.8	20 27.4	11 35.9	- 7 40.0	+0.4795	0.5867	0.0850	+52	-11
ξ^1 Sagittarii	6	1.39	4.2	20 48.5	14 43.5	- 4 39.5	+1.1125	0.5869	0.0920	+69	+33
Yarnall 8035	6½	+1.38	+ 3.8	-19 18.3	14 51.5	- 4 31.8	-0.4037	0.5869	+0.0921	+ 2	-64
Yarnall 8088	6	+1.34	+ 3.9	-19 16.2	17 6.8	- 2 21.6	-0.2257	0.5869	+0.0970	+12	-51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. $\Delta\alpha$	Red'ns from 1882.0. $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
Yarnall 8122	6½	+1.32	+ 4.0	−18 55.0	13 18 45.8	− 0 46.5	−0.4214	0.5869	+0.1005	+ 2	−65
B. A. C. 6536	6	1.31	4.1	19 28.4	19 13.1	− 0 20.2	+0.1886	0.5869	0.1015	+35	−27
d Sagittarii	5	1.26	4.3	19 9.6	23 2.8	+ 3 20.7	+0.2751	0.5870	0.1096	+41	−22
ρ^1 Sagittarii	4	1.24	4.3	18 4.0	14 0 43.1	+ 4 57.3	−0.6449	0.5870	0.1130	−10	−86
ρ^2 Sagittarii	5½	1.24	4.2	18 31.5	0 46.4	+ 5 0.4	−0.1758	0.5870	0.1131	+16	−48
B. A. C. 6658	6	+1.20	+ 4.4	−18 35.7	3 19.6	+ 7 27.8	+0.1910	0.5869	+0.1183	+37	−27
e^1 Sagittarii	6	1.12	4.2	16 33.7	8 31.8	−11 31.9	−1.2156	0.5867	0.1289	−50	−90
g Sagittarii	5½	1.03	4.4	15 48.1	15 36.5	− 4 43.4	−1.0125	0.5860	0.1426	−30	−90
B. A. C. 6992	6½	0.91	4.7	15 9.3	15 1 0.3	+ 4 19.1	−0.2355	0.5849	0.1596	+18	−52
β Capricorni	3	0.91	4.7	15 9.1	1 6.1	+ 4 24.7	−0.2233	0.5849	0.1598	+18	−51
B. A. C. 7063	6	+0.87	+ 4.8	−15 26.9	5 15.2	+ 8 24.4	+0.7499	0.5843	+0.1668	+72	+ 4
B. A. C. 7087	5	0.84	4.7	14 7.5	6 33.5	+ 9 39.8	−0.3494	0.5841	0.1689	+12	−59
τ^1 Capricorni	6	0.85	4.9	15 33.2	7 50.6	+10 53.9	+1.2924	0.5840	0.1710	+75	+52
τ^2 Capricorni	5	0.84	4.9	15 22.0	8 38.6	+11 40.2	+1.2419	0.5839	0.1722	+75	+44
B A. C. 7221	6½	0.77	4.6	12 58.8	13 24.6	− 7 44.6	−0.2926	0.5832	0.1796	+17	−55
B. A. C. 7242	6	+0.74	+ 4.4	−12 1.1	14 25.3	− 6 46.1	−1.0644	0.5831	+0.1812	−30	−90
8 Aquarii	6	0.73	4.8	13 30.5	17 14.5	− 4 3.2	+0.9307	0.5827	0.1852	+77	+15
ν Aquarii	4½	0.69	4.5	11 50.8	21 17.2	− 0 9.8	+0.0454	0.5820	0.1908	+36	−35
17 Aquarii	6½	0.63	4.2	9 49.2	16 2 53.5	+ 5 14.1	−0.8690	0.5812	0.1979	−14	−90
19 Aquarii	6	0.63	4.3	10 14.9	3 50.3	+ 6 8.8	−0.2573	0.5811	0.1991	+21	−53
ξ Aquarii	4½	+0.58	+ 4.0	− 8 22.9	9 6.5	+11 13.2	−1.0349	0.5803	+0.2049	−25	−90
B. A. C. 7562	6½	0.55	4.3	9 34.6	12 6.6	− 9 53.3	+0.7634	0.5798	0.2079	+75	+ 4
c^1 Capricorni	5½	0.55	4.3	9 37.4	12 8.8	− 9 51.2	+0.8155	0.5798	0.2080	+81	+ 8
c^2 Capricorni	6½	0.55	4.2	9 49.1	12 40.6	− 9 20.6	+1.1189	0.5797	0.2085	+80	+29
30 Aquarii	5½	0.51	3.9	7 6.5	19 52.0	− 2 25.1	−0.0437	0.5788	0.2149	+34	−40
B. A. C. 7744	6	+0.47	+ 3.6	− 5 18.1	23 53.0	+ 1 27.1	−0.9344	0.5783	+0.2179	−16	−90
44 Aquarii	5½	0.47	3.6	5 58.5	17 1 43.6	+ 3 13.5	+0.1307	0.5781	0.2192	+44	−30
51 Aquarii	5½	0.46	3.5	5 26.0	4 41.7	+ 6 5.1	+0.2513	0.5778	0.2209	+51	−24
κ Aquarii	5	0.43	3.5	− 4 50.1	10 29.4	+11 40.0	+0.9530	0.5772	0.2238	+85	+16
				NEW	*MOON.*						
π Piscium	6	+0.55	+ 1.8	+11 32.3	20 14 33.0	−11 3.2	+1.1682	0.5794	+0 1822	+90	+39
104 Piscium	6½	0.58	2.3	13 41.2	15 25 8	−10 12.0	−0.8216	0.5794	0.1809	− 9	−77
19 Arietis	6	0.68	1.7	14 43.6	21 5 34.9	+ 3 25.7	+0.5399	0.5801	0.1586	+74	− 1
27 Arietis	6	0.75	1.9	17 10.9	13 1.1	+10 35.3	−0.8132	0.5805	0.1455	− 9	−73
40 Arietis	6½	+0.81	+ 1.6	+17 47.5	20 22.2	− 6 19.9	−0.4155	0.5806	+0.1319	+15	−52
π Arietis	6	0.82	1.5	16 58.4	20 42.0	− 6 0.9	+0.4612	0.5806	0.1312	+68	− 3
ρ^2 Arietis	6	0.84	1.4	17 51.2	23 24.5	− 3 24.4	−0.0890	0.5805	0.1259	+32	−32
ρ^3 Arietis	6	0.84	1.4	17 33.1	23 39.5	− 3 10.0	+0.2515	0.5805	0.1255	+53	−13
53 Arietis	6	0.89	1.1	17 25.4	22 4 16.1	+ 1 16.4	+0.9419	0.5803	0.1164	+90	+28
54 Arietis	6½	+0.90	+ 1.2	+18 20.5	4 38.1	+ 1 37.6	+0.0450	0.5803	+0.1157	+40	−24
δ Arietis	4½	0.92	1.2	19 16.8	5 59.0	+ 2 55.5	−0.7626	0.5802	0.1130	− 6	−71
B. A. C. 1032	6½	0.96	1.3	20 4.9	9 50.2	+ 6 38.2	−1.1676	0.5799	0.1052	−39	−70
13 Tauri	6½	1.06	0.5	19 19.3	18 49.9	− 8 42.1	+0.4757	0.5787	0.0865	+69	+ 3
B. A. C. 1143	6½	1.07	0.7	20 33.2	19 42.6	− 7 49.7	−0.7249	0.5787	0.0861	− 4	−70
B. A. C. 1242	6½	+1.15	+ 0.2	+19 52.0	23 2 43.0	− 1 6.5	+0.5278	0.5773	+0.0698	+74	+ 7
A^2 Tauri	6	1.17	+ 0.3	21 41.4	4 27.0	+ 0 33.7	−1.2500	0.5770	0.0659	−54	−68
ω^2 Tauri	5½	1.23	− 0.3	20 17.2	9 31.7	+ 5 27.2	+0.5177	0.5759	0.0551	+73	+ 8
53 Tauri	6	1.24	0.2	20 51.3	10 26.0	+ 6 19.6	−0.0270	0.5757	0.0531	+36	−22
56 Tauri	6	1.25	0.1	21 29.2	10 29.6	+ 6 23.1	−0.6860	0.5757	0.0530	− 1	−66
κ^1 Tauri	5½	+1.29	− 0.1	+22 1.3	12 55.1	+ 8 43.2	−1.1231	0.5751	+0.0478	−35	−68
κ^2 Tauri	6½	1.29	0.1	21 55.7	12 56.4	+ 8 44.5	−1.0240	0.5751	0.0478	−26	−68
B. A. C. 1373	6½	1.29	0.4	21 21.3	14 3.3	+ 9 49.0	−0.3721	0.5748	0.0453	+17	−41
ι Tauri	5	1.48	2.0	21 25.2	24 5 3.6	+ 0 16.6	−0.0021	0.5704	0.0133	+37	−16
l Tauri	5½	1.49	2.1	20 15.6	7 7.6	+ 2 16.2	+1.2488	0.5698	0.0090	+90	+66
105 Tauri	6	+1.50	− 1.8	+21 32.8	7 8.8	+ 2 17.3	−0.1136	0.5698	+0.0090	+31	−22
n Tauri	6	+1.57	− 2.3	+21 58.4	12 3.7	+ 7 1.7	−0.5495	0.5680	−0.0014	+ 6	−50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
ο Tauri	6	+1.61	− 2.5	+21 50.0	24 15 42.7	+10 32.9	−0.4214	0.5667	−0.0090	+13	−41
B. A. C. 1733	6½	1.62	3.1	20 23.2	18 22.6	−10 52.8	+1.0914	0.5654	0.0145	+90	+49
ζ Tauri	3½	1.65	3.1	21 4.1	20 7.3	− 9 11.7	+0.3358	0.5647	0.0181	+59	+ 1
B. A. C. 1835	6½	1.69	3.6	20 49.5	25 0 52.0	− 4 37.0	+0.4889	0.5626	0.0276	+71	+ 9
B. A. C. 1867	6½	1.71	4.3	20 16.1	3 4.6	− 2 29.0	+1.0198	0.5617	0.0320	+90	+41
χ¹ Orionis	4½	+1.72	− 4.2	+20 15.1	3 33.8	− 2 0.8	+1.0224	0.5614	−0.0330	+90	+41
χ⁴ Orionis	5	1.76	4.6	20 8.3	7 49.0	+ 2 5.6	+0.9883	0.5595	0.0412	+90	+38
68 Orionis	6	1.80	5.2	19 48.8	11 28.2	+ 5 37.2	+1.1773	0.5577	0.0483	+90	+54
B. A. C. 2039	6½	1.87	5.0	21 15.0	15 40.2	+ 9 40.7	−0.5901	0.5557	0.0561	+ 4	−58
15 Geminorum	6	1.90	5.4	20 51.5	18 36.2	−11 29.3	−0.3406	0.5542	0.0615	+18	−41
16 Geminorum	6	+1.90	− 5.5	+20 33.9	18 41.2	−11 24.5	−0.0273	0.5542	−0.0616	+36	−22
ν Geminorum	4½	1.90	5.7	20 17.0	19 9.5	−10 57.1	+0.2474	0.5540	0.0625	+53	− 8
B. A. C. 2432	6½	2.13	8.9	18 29.7	26 23 32.9	−10 23.9	+0.0517	0.5413	0.1063	+41	−23
Lalande 14620	6	2.16	9.6	17 19.5	27 0 46.4	− 6 18.3	+0.8774	0.5391	0.1116	+90	+23
f Geminorum	6	2.19	9.7	17 56.4	4 29.1	− 2 42.7	−0.2204	0.5375	0.1170	+25	−39
1 Cancri	6	+2.25	− 9.5	+16 6.1	13 7.4	+ 5 39.4	+0.7382	0.5336	−0.1289	+90	+12
3 Cancri	6	2.28	10.9	17 37.6	14 58.2	+ 7 26.7	−1.1817	0.5328	0.1313	−39	−73
5 Cancri	6	2.27	10.8	16 46.6	15 20.7	+ 7 48.6	−0.2937	0.5326	0.1318	+21	−46
29 Cancri	6	2.37	12.9	14 35.8	28 5 1.0	− 2 56.2	+0.1931	0.5265	0.1484	+49	−20
B. A. C. 2872	6½	2.38	13.4	13 39.4	7 39.8	− 0 22.0	+0.8381	0.5255	0.1512	+90	+16
A¹ Cancri	6	+2.41	−13.8	+13 6.0	12 29.9	+ 4 19.3	+0.7093	0.5236	−0.1564	+90	+ 7
A² Cancri	6	2.42	14.1	12 32.3	14 26.0	+ 6 11.9	+1.0261	0.5229	0.1584	+90	+27
60 Cancri	6	2.45	14.6	12 4.3	19 5.4	+10 43.1	+0.7943	0.5213	0.1630	+90	+11
α Cancri	4	2.46	14.6	12 18.6	20 24.7	+12 0.0	+0.3152	0.5209	0.1642	+56	−16
κ Cancri	5	2.47	15.2	11 8.3	29 1 15.9	− 7 17.3	+0.8058	0.5194	0.1688	+90	+11
B. A. C. 3122	6½	+2.50	−15.1	+12 2.4	2 18.8	− 6 16.3	−0.3714	0.5190	−0.1697	+17	−55
ω Leonis	6	2.55	16.3	9 33.9	12 11.5	+ 3 19.2	+0.6580	0.5163	0.1776	+85	+ 1
k Leonis	6	2.56	16.2	10 13.8	14 2.7	+ 5 7.3	−0.4107	0.5158	0.1790	+15	−59
14 Sextantis	6	2.65	17.8	6 10.9	30 8 44.2	− 0 43.1	+0.6255	0.5124	0.1905	+81	− 3
16 Sextantis	6	2.66	17.8	6 44.6	10 3.2	+ 0 33.7	−0.2498	0.5121	0.1912	+24	−51
19 Sextantis	6½	+2.66	−18.2	+ 5 11.5	11 59.5	+ 2 26.7	+1.1013	0.5121	−0.1921	+90	+28
Yarnall 4339	6½	2.70	18.5	4 31.6	19 23.2	+ 9 37.9	+0.4076	0.5116	0.1952	+63	−15
34 Sextantis	6	2.75	18.6	4 11.6	31 4 8.1	− 5 52.0	−0.9428	0.5113	0.1981	−16	−86
36 Sextantis	6	2.75	19.0	3 6.2	5 30.8	− 4 31.6	−0.0062	0.5113	0.1984	+37	−38
B. A. C. 3726	6	2.77	19.3	1 38.7	9 21.2	− 0 47.6	+0.8429	0.5113	0.1992	+90	+ 9
55 Leonis	6	+2.78	−19.3	+ 1 21.6	11 13.9	+ 1 1.9	+0.7875	0.5114	−0.1996	+90	+ 6
p² Leonis	6	2.80	19.5	0 37.8	15 31.6	+ 5 12.4	+0.7381	0.5115	0.2002	+90	+ 3
p⁵ Leonis	5	+2.83	−19.5	+ 0 34.0	21 1.1	+10 32.6	−0.2939	0.5119	−0.2007	+22	−55
APRIL.											
B. A. C. 3901	6	+2.85	−19.6	− 1 3.4	1 4 39.1	− 6 2.2	−0.0316	0.5121	−0.2007	+36	−39
B. A. C. 3903	6½	2.85	19.5	0 15.2	4 44.0	− 5 57.5	−0.9352	0.5121	0.2007	−15	−90
B. A. C. 3909	6	2.85	19.5	0 12.3	5 27.7	− 5 15.0	−1.1347	0.5122	0.2007	−30	−90
e Leonis	4½	2.87	19.7	2 21.5	5 57.2	− 4 46.3	+1.1460	0.5123	0.2007	+88	+31
B. A. C. 3955	5½	+2.87	−19.6	− 1 47.3	10 18.0	− 0 32.9	−0.3548	0.5127	−0.2003	+18	−59
B. A. C. 4201	6½	2.99	18.9	8 1.6	2 12 34.6	+ 0 58.5	+1.3250	0.5207	0.1927	+82	+54
χ Virginis	5	3.01	18.5	7 21.1	18 27.3	+ 6 40.9	−0.5420	0.5228	0.1898	+ 6	−73
B. A. C. 4259	6	3.01	18.5	7 23.3	18 31.9	+ 6 45.4	−0.5152	0.5228	0.1898	+ 8	−71
28 Virginis	6	3.00	18.3	6 51.4	19 51.6	+ 8 2.7	−1.3502	0.5233	0.1891	−65	−90
B. A. C. 4312	6½	+3.04	−18.2	− 9 42.1	3 0 42.3	−11 15.1	+0.8578	0.5251	−0.1861	+81	+11
ψ Virginis	5	3.04	18.1	8 54.2	2 14.2	− 9 46.0	−0.3006	0.5257	0.1851	+19	−55
g Virginis	6	3.06	17.5	10 6.8	9 8.0	− 3 4.6	−0.2359	0.5286	0.1802	+22	−51
50 Virginis	6	3.06	17.5	9 42.3	10 4.8	− 2 9.4	−0.8531	0.5289	0.1795	−13	−90
58 Virginis	6	3.06	17.2	9 55.7	13 58.2	+ 1 36.9	−1.2990	0.5307	0.1763	−4	−90
α Virginis	1	+3.08	−16.8	−10 33.0	17 50.4	+ 5 22.1	−1.2963	0.5325	−0.1728	−54	−90
i Virginis	5½	+3.10	−16.7	−12 5.9	18 35.8	+ 6 6.0	+0.2598	0.5329	−0.1722	+48	−23

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 4531	6	+3.12	-16.3	-12 36.8	3 22 32.8	+ 9 55.7	+0.1484	0.5347	-0.1684	+41	-29
B. A. C. 4679	6½	3.14	14.3	14 24.4	4 13 4.7	+ 0 0.4	-0.1916	0.5417	0.1526	+18	-53
B. A. C. 4700	5½	3 14	13.9	15 44.9	16 7.7	+ 2 57.6	+0.7482	0.5433	0.1488	+72	+ 5
B. A. C. 4896	6	3.14	11.1	17 18.1	5 11 16.8	- 2 31.0	-0.1832	0.5530	0.1222	+18	-52
ι^1 Libræ	4½	3.14	9.5	19 20.8	20 42.1	+ 6 35.5	+0.9262	0.5577	0.1073	+71	+17
ι^2 Libræ	6	+3.14	- 9.4	-19 12.3	21 12.3	+ 7 4.6	+0.7199	0.5579	-0.1064	+71	+ 4
28 Libræ	6	3.10	9.1	17 43.9	6 0 39.2	+10 24.6	-1.2123	0.5596	0.1005	-53	-90
B. A. C. 5109	6½	3.09	8.0	19 16.2	5 53.1	- 8 32.3	-0.0706	0.5626	0.0898	+20	-42
41 Libræ	6	3.08	7.6	18 54.8	8 41.6	- 5 49.6	-0.6982	0.5639	0.0862	-15	-90
κ Libræ	5	3.08	7.3	19 17.8	10 2.7	- 4 31.3	-0.4044	0.5640	0.0838	+ 1	-64
λ Libræ	6	+3.06	- 6.4	-19 48.9	15 3.9	+ 0 19.4	-0.2497	0.5663	-0.0745	+ 9	-53
B. A. C. 5278	6	3.07	6.0	21 8.6	16 44.5	+ 1 56 5	+1.0390	0.5670	0.0712	+69	+27
B. A. C. 5281	6	3.06	6.0	20 38.5	16 57.4	+ 2 8.9	+0.4915	0.5671	0.0708	+52	-10
β^1 Scorpii	2	3.01	5.6	19 29.0	20 22.6	+ 5 26.9	-0.9690	0.5685	0.0642	-35	-90
β^2 Scorpii	5½	3.01	5.6	19 28.8	20 22.7	+ 5 27.0	-0.9725	0.5685	0.0642	-35	-90
B. A. C. 5333	6½	+3.01	- 5.6	-19 21.6	20 26.4	+ 5 30.4	-1.1043	0.5686	-0.0640	-45	-90
ω^1 Scorpii	4½	3.02	5.4	20 21.0	20 57.5	+ 6 0.5	-0.0861	0.5688	0.0630	+16	-43
ω^2 Scorpii	5	3.03	5 4	20 33.0	21 12.7	+ 6 15.2	+0.1108	0.5688	0.0625	+27	-31
B. A. C. 5395	6	3.01	4.8	21 5.9	23 56.3	+ 8 53.0	+0.5286	0.5691	0.0610	+53	- 7
ψ Ophiuchi	5	2.97	4.2	19 45.7	7 4 28.6	-10 44.4	-1.1251	0.5715	0.0479	-49	-90
ω Ophiuchi	5	+2.96	- 3.3	-21 12.8	7 54.5	- 7 26.0	+0.2589	0.5726	-0.0418	+34	-23
B A. C. 5567	6	2.91	2.9	20 10.7	11 32.8	- 3 55.6	-0.9683	0.5738	0.0332	-38	-90
B. A. C. 5663	6½	2.86	2.1	20 13.0	17 2.0	+ 1 21.7	-1.0737	0.5753	0.0216	-47	-90
Lalande 30971	6½	2.81	1.3	20 13.1	21 25.8	+ 5 36.0	-1.1468	0.5765	0.0124	-54	-90
B. A. C. 5758	6	2.83	0.9	21 24.0	22 26.0	+ 6 33.9	+0.0826	0.5767	0.0102	+21	-33
Yarnall 7137	6½	+2.78	- 0.5	-20 49.9	8 2 7.2	+10 7.1	-0.5370	0.5775	-0.0022	-14	-75
ξ Ophiuchi	5	2.76	+ 0.1	20 59.1	4 41.1	-11 24.7	-0.3741	0.5780	+0.0034	- 5	-62
B. A. C. 5866	6	2.74	0.4	21 19.8	6 14.8	- 9 54.4	-0.0035	0.5783	0.0068	+16	-38
B. A. C. 5954	6	2.68	1.4	21 50.4	12 8.7	- 4 13.6	+0.6070	0.5793	0.0198	+57	- 2
58 Ophiuchi	5	2.66	1.6	21 37.4	14 7.1	- 2 19.5	+0.4231	0.5796	0.0240	+43	-13
B. A. C. 5992	6½	+2.67	+ 1.8	-22 8.4	14 30.3	- 1 57.2	+0.9712	0.5796	+0.0249	+68	+22
B. A. C. 6081	6	2.54	2.4	20 19.7	21 4.8	+ 4 22.7	-0.7050	0.5803	0.0393	-20	-90
B. A. C. 6098	6	2.54	2.7	20 44.1	22 10.1	+ 5 25.6	-0.2370	0.5804	0.0417	+ 6	-52
Yarnall 7631	6½	2.53	3.1	21 27.2	9 0 3.7	+ 7 14.9	+0.5925	0.5805	0.0459	+57	- 4
μ Sagittarii	4½	2.49	3.4	21 5.2	2 49.1	+ 9 54.2	+0.3459	0.5806	0.0519	+40	-18
14 Sagittarii	6	+2.50	+ 3.6	-21 44.5	3 0.9	+10 5.5	+1.0356	0.5806	+0.0523	+69	+27
15 Sagittarii	5	2.48	3.4	20 45.7	3 25.8	+10 29.6	+0.0395	0.5806	0.0532	+22	-35
16 Sagittarii	6	2.48	3.3	20 25.3	3 26.5	+10 30.2	-0.3126	0.5806	0.0532	+ 3	-57
21 Sagittarii	5	2.42	3.9	20 36.1	7 40.2	- 9 25.6	+0.1197	0.5806	0.0623	+27	-31
B. A. C. 6347	6½	2.34	4.1	21 9.0	13 19.5	- 3 58.9	+1.0713	0.5805	0.0744	+69	+30
Yarnall 7918	6	+2.29	+ 4.5	-19 23.7	15 2.3	- 2 19.9	-0.6082	0.5804	+0.0780	-11	-82
Yarnall 7942	6	2.29	4.8	19 43.6	16 19.6	- 1 5.5	-0.1660	0.5803	0.0807	+13	-57
Yarnall 7955	6	2.28	5.0	20 24.0	17 5.2	- 0 21.6	+0.5903	0.5803	0.0824	+60	- 4
29 Sagittarii	6	2.27	5.1	20 27.4	17 50.3	+ 0 21.9	+0.7107	0.5803	0.0839	+70	+ 3
Yarnall 8035	6½	2.20	5.2	19 18.3	21 10.7	+ 3 34.8	-0.1839	0.5801	0.0908	+14	-49
Yarnall 8088	6	+2.17	+ 5.4	-19 16.2	23 29.5	+ 5 48.5	-0.0046	0.5799	+0.0956	+24	-38
Yarnall 8122	6½	2.15	5.6	18 55.0	10 1 11.1	+ 7 26.3	-0.2032	0.5798	0.0989	+13	-50
B. A. C. 6536	6	2.15	5.7	19 28.3	1 39.1	+ 7 53.3	+0.4141	0.5797	0.0999	+49	-14
d Sagittarii	5	2.09	6.1	19 9.6	5 35.0	+11 40.5	+0.5008	0.5793	0.1079	+56	- 9
ρ^1 Sagittarii	4	2.05	6.0	18 4.0	7 18.2	-10 40.2	-0.4322	0.5792	0.1112	+ 2	-66
ρ^2 Sagittarii	5½	+2.05	+ 6.0	-18 31.4	7 21.6	-10 36.8	+0.0436	0.5791	+0.1113	+28	-35
B. A. C. 6658	6	2.02	6.3	18 35.7	9 59.2	- 8 5.1	+0.4141	0.5789	0.1163	+51	-14
e^1 Sagittarii	6	1.91	6.3	16 33.6	15 20.7	- 2 55.4	-1.0144	0.5782	0.1265	-32	-90
e^2 Sagittarii	5	1.90	6.3	16 23.8	16 6.4	- 2 11.4	-1.0847	0.5780	0.1279	-37	-90
g Sagittarii	5½	1.79	6.7	15 48.1	22 38.7	+ 4 6.5	-0.8147	0.5769	0.1396	-17	-90
B. A. C. 6992	6½	+1.67	+ 7.1	-15 9.3	11 8 21.3	-10 32.3	-0.0338	0.5752	+0.1560	+38	-39
3 Capricorni	3	+1.67	+ 7.1	-15 9.1	8 27.2	-10 26.6	-0.0214	0.5751	+0.1562	+29	-39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
Yarnall 8844	6½	+1.68	+ 6.8	-13 46.4	11 9 47.9	- 9 8.8	-1.2073	0.5749	+0.1583	-46	-90
B. A. C. 7063	6	1.61	7.5	15 26.8	12 44.9	- 6 18.3	+0.9636	0.5743	0.1629	+75	+19
B. A. C. 7087	5	1.58	7.3	14 7.4	14 5.9	- 5 0.2	-0.1549	0.5741	0.1650	+23	-46
B. A. C. 7221	6½	1.48	7.3	12 58.7	21 11.3	+ 1 49.8	-0.1049	0.5729	0.1744	+26	-43
B. A. C. 7242	6	1.45	7.0	12 1.0	22 14.2	+ 2 50.4	-0.8905	0.5728	0.1768	-18	-90
8 Aquarii	6	+1.43	+ 7.6	-13 30.4	12 1 9.2	+ 5 39.0	+1.1334	0.5724	+0.1807	+77	+32
ν Aquarii	4½	1.36	7.2	11 50.8	5 20.7	+ 9 41.5	+0.2287	0.5717	0.1861	+46	-25
17 Aquarii	6½	1.29	6.8	9 49.2	11 9.0	- 8 42.6	-0.7084	0.5708	0.1929	- 5	-90
19 Aquarii	6	1.27	7.0	10 14.9	12 7.7	- 7 46.1	-0.0884	0.5707	0.1940	+30	-42
ξ Aquarii	4½	1.20	6.6	8 22.9	17 35.1	- 2 30.4	-0.8861	0.5700	0.1997	-15	-90
B. A. C. 7562	6½	+1.17	+ 6.9	- 9 34.6	20 41.5	+ 0 29.4	+0.9365	0.5696	+0.2027	+81	+16
c^1 Capricorni	5½	1.17	6.9	9 37.3	20 43.7	+ 0 31.5	+0.9897	0.5696	0.2028	+81	+19
c^2 Capricorni	6½	1.17	7.0	9 49.1	21 16.7	+ 1 3.3	+1.2972	0.5695	0.2033	+80	+50
30 Aquarii	5½	1.07	6.5	7 5.4	13 4 42.9	+ 8 13.7	+0.1033	0.5689	0.2096	+42	-32
B. A. C. 7744	6	1.02	6.1	5 18.0	8 51.9	-11 46.1	-0.8081	0.5687	0.2125	- 6	-90
44 Aquarii	5½	+1.01	+ 6.2	- 5 58.5	10 46.1	- 9 56.0	+0.2700	0.5686	+0.2138	+52	-23
51 Aquarii	5½	0.98	6.1	5 25.9	13 50.0	- 6 58.6	+0.3866	0.5686	0.2156	+60	-17
κ Aquarii	5	0.93	5.9	4 50.1	19 48.5	- 1 12.8	+1.0869	0.5685	0.2184	+85	+26
3 Piscium	6	0.84	5.0	0 26.8	14 5 49.8	+ 8 27.2	-1.0735	0.5687	0.2214	-25	-90
B. A. C. 8152	6½	0.77	4.7	- 0 21.4	15 49.3	- 5 54.6	+1.0568	0.5695	0.2220	+90	+24
κ Piscium	4½	+0.76	+ 4.5	+ 0 36.7	17 18.6	- 4 28.4	+0.4263	0.5697	+0.2220	+64	-14
9 Piscium	6½	0.76	4.6	0 28.5	17 27.0	- 4 20.3	+0.5902	0.5697	0.2220	+77	- 5
15 Piscium	6½	0.72	4.3	0 39.7	21 2.4	- 0 52.6	+1.2028	0.5701	0.2217	+90	+37
16 Piscium	6	0.73	4.3	1 26.9	21 26.5	- 0 29.3	+0.5112	0.5702	0.2216	+70	-10
19 Piscium	6	0.71	4.0	2 50.0	15 1 47.3	+ 3 42.2	+0.0966	0.5708	0.2207	+43	-32
22 Piscium	6½	+0.69	+ 4.0	+ 2 16.5	4 12.2	+ 6 2.0	+1.1817	0.5711	+0.2199	+90	+35
d Piscium	5½	0.66	3.0	7 32.2	16 34.6	- 6 2.1	-1.3593	0.5732	0.2137	-68	-83
45 Piscium	6	0.64	+ 2.9	7 2.4	18 46.1	- 3 55.4	-0.3986	0.5737	0.2121	+16	-60
				NEW	*MOON.*						
δ Arietis	4½	+0.75	0.0	+19 16.8	18 16 12.8	- 9 2.6	-0.8696	0.5860	+0.1126	-13	-71
B. A. C. 1032	6½	0.77	- 0.1	20 4.9	20 0.4	- 5 23.6	-1.2770	0.5860	0.1048	-57	-70
13 Tauri	6½	0.82	0.7	19 19.3	19 4 50.8	+ 3 6.8	+0.3431	0.5858	0.0861	+59	- 5
B. A. C. 1143	6½	0.83	0.8	20 33.1	5 42.6	+ 3 58.8	-0.8480	0.5857	0.0857	-12	-70
JUPITER				19 27.5	10 51.0	+ 8 53.4	+0.6823	0.5764	0.0710	+90	+15
B. A. C. 1242	6½	+0.87	- 1.1	+19 52.0	12 35.0	+10 33.5	+0.3826	0.5850	+0.0695	+62	- 1
A^2 Tauri	6	0.88	1.2	20 41.3	14 17.0	-11 48.3	-0.3484	0.5848	0.0657	+18	-41
ω^1 Tauri	6	0.89	1.3	19 17.8	15 55.0	-10 13.9	+1.1948	0.5846	0.0621	+90	+55
ω^2 Tauri	5½	0.92	1.4	20 17.2	19 15.3	- 7 1.2	+0.3667	0.5839	0.0547	+61	0
53 Tauri	6	0.93	1.5	20 51.3	20 8.5	- 6 9.9	-0.1744	0.5837	0.0528	+27	-30
56 Tauri	6	+0.94	- 1.3	+21 29.2	20 12.1	- 6 6.4	-0.8252	0.5837	+0.0526	-11	-69
κ^1 Tauri	5½	0.96	1.4	22 1.3	22 34.5	- 3 49.4	-1.2636	0.5832	0.0475	-58	-68
κ^2 Tauri	6½	0.96	1.4	21 55.7	22 35.8	- 3 48.1	-1.1652	0.5832	0.0474	-40	-68
B. A. C. 1373	6½	0.96	1.6	21 21.3	23 41.2	- 2 45.2	-0.5220	0.5829	0.0449	+ 8	-51
ι Tauri	5	1.09	2.8	21 25.1	20 14 21.6	+11 22.6	-0.1680	0.5785	0.0126	+28	-26
l Tauri	5½	+1.10	- 3.1	+20 15.6	16 22.9	-10 40.5	+1.0681	0.5778	+0.0083	+90	+47
105 Tauri	6	1.11	2.8	21 32.8	16 24.0	-10 39.5	-0.2802	0.5778	+0.0082	+21	-33
n Tauri	6	1.15	3.2	21 58.4	21 12.1	- 6 1.9	-0.7158	0.5760	-0.0027	- 4	-68
o Tauri	6	1.18	3.4	21 50.0	21 0 46.2	- 2 35.6	-0.5919	0.5744	0.0098	+ 3	-55
B. A. C. 1733	6½	1.21	3.8	20 23.2	3 22.5	- 0 4.9	+0.9038	0.5733	0.0152	+90	+34
ζ Tauri	3½	+1.21	- 3.8	+21 4.1	5 4.8	+ 1 33.7	+0.1545	0.5725	-0.0188	+47	- 8
B. A. C. 1835	6½	1.25	4.3	20 49.5	9 43.1	+ 6 2.0	+0.3031	0.5704	0.0285	+56	- 1
B. A. C. 1867	6½	1.26	4.7	20 16.1	11 52.7	+ 8 7.0	+0.8271	0.5693	0.0329	+90	+28
χ^1 Orionis	4½	1.27	4.7	20 15.1	12 21.2	+ 8 34.5	+0.8297	0.5690	0.0339	+90	+28
χ^4 Orionis	5	1.31	5.1	20 8.3	16 30.8	-11 24.7	+0.7943	0.5671	0.0422	+90	+25
68 Orionis	6	+1.34	- 5.4	+19 48.8	20 5.3	- 7 57.9	+0.9788	0.5651	-0.0492	+90	+37
B. A. C. 2039	6½	+1.41	- 5.4	+21 15.0	22 0 11.9	- 3 59.7	-0.7732	0.5628	-0.0571	- 8	-69

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
15 Geminorum	6	+1.43	− 5.7	+20 51.5	22 3 4.2	− 1 13.5	−0.5280	0.5612	−0.0624	+ 8	−54
16 Geminorum	6	1.42	5.7	20 33.9	3 9.1	− 1 8.7	−0.2175	0.5611	0.0626	+25	−34
ν Geminorum	4½	1.43	5.9	20 17.0	3 36.8	− 0 42.0	+0.0545	0.5609	0.0635	+41	−18
B. A. C. 2432	6½	1.65	8.3	18 29.7	23 4 31.8	− 0 37.1	−0.1263	0.5463	0.1060	+30	−33
Lalande 14620	6	1.69	9.0	17 19.5	8 41.3	+ 3 24.3	+0.6645	0.5438	0.1122	+89	+10
f Geminorum	6	+1.73	− 9.1	+17 56.4	12 20.6	+ 6 56.5	−0.4165	0.5418	−0.1175	+14	−52
1 Cancri	6	1.80	10.4	16 6.1	20 51.8	− 8 48.5	+0.5356	0.5370	0.1294	+74	+ 1
5 Cancri	6	1.82	10.3	16 46.6	23 3.4	− 6 41.1	−0.4890	0.5358	0.1322	+10	−58
29 Cancri	6	1.93	11.9	14 35.8	24 12 34.8	+ 6 25.3	−0.0021	0.5288	0.1485	+37	−31
B. A. C. 2872	6½	1.95	12.4	13 39.4	15 11.2	+ 8 57.1	+0.6403	0.5276	0.1512	+84	+ 4
A^1 Cancri	6	+1.99	−12.9	+13 6.0	19 59.9	−10 23.0	+0.5142	0.5254	−0.1563	+71	− 4
A^2 Cancri	6	1.99	13.2	12 32.3	21 55.1	− 8 31.3	+0.8305	0.5245	0.1583	+90	+14
60 Cancri	6	2.04	13.7	12 4.3	25 2 32.5	− 4 2.1	+0.6025	0.5226	0.1627	+79	0
α Cancri	4	2.05	13.7	12 18.6	3 51.4	− 2 45.6	+0.1259	0.5220	0.1639	+44	−26
κ Cancri	5	2.08	14.3	11 8.3	8 41.0	+ 1 55.5	+0.6170	0.5202	0.1682	+80	0
B. A. C. 3122	6½	+2.09	−14.1	+12 2.4	9 43.5	+ 2 56.1	−0.5541	0.5198	−0.1691	+ 7	−68
ω Leonis	6	2.17	15.3	9 33.9	19 33.8	−11 30.7	+0.4779	0.5164	0.1768	+68	− 9
k Leonis	6	2.18	15.2	10 13.9	21 24.5	− 9 43.2	−0.5860	0.5158	0.1781	+ 5	−72
B. A. C. 3336	5	2.24	16.3	7 14.9	26 5 0.0	− 2 20.8	+1.3434	0.5138	0.1832	+90	+62
B. A. C. 3438	6½	2.32	17.3	5 34.3	15 0.0	+ 7 22.1	+1.3421	0.5119	0.1887	+90	+60
14 Sextantis	6	+2.33	−17.1	+ 6 10.9	16 41.1	+ 8 24.4	+0.4634	0.5116	−0.1892	+66	−11
16 Sextantis	6	2.34	17.0	6 44.6	17 23.1	+ 9 41.2	−0.4084	0.5115	0.1898	+15	−61
19 Sextantis	6½	2.35	17.5	5 11.5	19 19.3	+11 34.1	+0.9421	0.5112	0.1907	+90	+17
Yarnall 4339	6½	2.41	17.8	4 31.6	27 2 43.0	− 5 14.6	+0.2566	0.5106	0.1937	+52	−23
34 Sextantis	6	2.50	18.0	4 11.6	11 28.2	+ 3 15.8	−1.0819	0.5102	0.1964	−26	−86
36 Sextantis	6	+2.50	−18.3	+ 3 6.2	12 50.9	+ 4 36.3	−0.1449	0.5102	−0.1968	+29	−45
B. A. C. 3726	6	2.51	18.8	1 38.7	16 4.1	+ 8 20.3	+0.7109	0.5102	0.1977	+90	+ 1
55 Leonis	6	2.54	18.8	1 21.6	18 34.3	+10 10.0	+0.6548	0.5103	0.1980	+83	− 2
B. A. C. 3779	6	2.57	19.1	0 6.5	22 35.0	− 9 56.0	+1.2437	0.5105	0.1987	+90	+41
p^2 Leonis	6	2.58	19.1	0 37.8	22 52.1	− 9 39.4	+0.6110	0.5105	0.1987	+79	− 4
p^5 Leonis	5	+2.62	−19.0	+ 0 34.0	28 4 21.9	− 4 18.9	−0.4132	0.5110	−0.1991	+15	−63
B. A. C. 3901	6	2.69	19.2	− 1 3.4	12 0.1	+ 3 6.4	−0.1414	0.5120	0.1991	+30	−45
B. A. C. 3903	6½	2.69	19.0	0 15.2	12 5.0	+ 3 11.1	−1.0438	0.5121	0.1991	−23	−90
B. A. C. 3909	6	2.69	19.1	0 12.3	12 48.6	+ 3 53.5	−1.2422	0.5122	0.1991	−41	−90
e Leonis	4½	2.70	19.6	2 21.5	13 18.2	+ 4 22.3	+1.0361	0.5123	0.1991	+88	+22
B. A. C. 3955	5½	+2.74	−19.3	− 1 47.3	17 39.0	+ 8 35.7	−0.4563	0.5130	−0.1987	+13	−66
B. A. C. 4201	6½	2.97	19.5	8 1.6	29 19 53.4	+10 5.0	+1.2569	0.5211	0.1917	+82	+43
χ Virginis	5	3.01	19.1	7 21.1	30 1 44.9	− 8 13.9	−0.5974	0.5235	0.1887	+ 3	−78
B. A. C. 4259	6	3.01	19.1	7 23.3	1 49.4	− 8 9.5	−0.5707	0.5235	0.1887	+ 5	−76
B. A. C. 4312	6½	3.07	18.9	9 42.1	7 58.2	− 2 11.6	+0.8074	0.5261	0.1850	+81	+ 8
ψ Virginis	5	+3.07	−18.7	− 8 54.2	9 29.7	− 0 42.9	−0.3453	0.5267	−0.1841	+16	−58
g Virginis	6	3.14	18.2	10 6.9	16 21.2	+ 5 56.2	−0.2714	0.5300	0.1791	+20	−53
50 Virginis	6	3.15	18.1	9 42.3	17 17.6	+ 6 51.0	−0.8849	0.5304	0.1784	−16	−90
58 Virginis	6	+3.16	−17.8	− 9 55.7	21 9.4	+10 35.7	−1.3231	0.5323	−0.1753	−60	−90

MAY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
α Virginis	1	+3.20	−17.5	−10 33.0	1 1 0.0	− 9 40.7	−1.3152	0.5344	−0.1721	−59	−90
i Virginis	5½	3.22	17.6	12 5.9	1 44.9	− 8 57.2	+0.2362	0.5348	0.1714	+47	−24
B. A. C. 4531	6	3.25	17.3	12 36.8	5 40.0	− 5 9.4	+0.1306	0.5369	0.1678	+40	−30
B. A. C. 4679	6½	3.37	15.7	15 24.5	20 3.5	+ 8 46.8	+0.8980	0.5449	0.1523	+75	+14
B. A. C. 4700	5½	3.39	15.4	15 44.9	23 4.6	+11 42.0	+0.7504	0.5467	0.1486	+71	+ 5
B. A. C. 4896	6	+3.49	−12.4	−17 18.1	2 17 59.1	+ 5 58.9	−0.1525	0.5577	−0.1219	+18	−46
ι^1 Libræ	4½	3.56	10.8	19 20.8	3 3 16.5	− 9 2.6	+0.9603	0.5628	0.1070	+71	+20
ι^2 Libræ	6	3.55	10.6	19 12.3	3 46.1	− 8 34.0	+0.7565	0.5631	0.1061	+71	+ 5
28 Libræ	6	3.52	10.2	17 43.9	7 10.0	− 5 17.2	−1.1604	0.5649	0.1003	−47	−90
B. A. C. 5109	6½	+3.56	− 9.1	−19 16.2	12 19.2	− 0 18.7	−0.0203	0.5674	−0.0910	+23	−39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
41 Libræ	6	+3.55	- 8.6	-18 54.9	3 15 5.1	+ 2 21.3	-0.6413	0.5688	-0.0861	-12	-86
κ Libræ	5	3.56	8.3	19 17.8	16 24.8	+ 3 38.2	-0.2477	0.5702	0.0836	+ 5	-59
λ Libræ	6	3.58	7.4	19 48.9	21 21.5	+ 8 24.5	-0.1891	0.5703	0.0741	+12	-49
B. A. C. 5278	6	3.61	6.9	21 8.6	23 0.7	+10 0.0	+1.0937	0.5725	0.0708	+69	+32
B. A. C. 5281	6	3.59	6.9	20 38.5	23 13.3	+10 12.3	+0.5490	0.5727	0.0701	+56	- 7
β^1 Scorpii	2	+3.56	- 6.4	-19 29.0	4 2 35.3	-10 32.9	-0.8995	0.5740	-0.0637	-30	-90
β^2 Scorpii	5½	3.56	6.4	19 28.8	2 35.4	-10 32.8	-0.9028	0.5740	0.0637	-30	-90
B. A. C. 5333	6½	3.56	6.4	19 21.6	2 43.4	-10 25.2	-1.0385	0.5741	0.0635	-40	-90
ω^1 Scorpii	4½	3.58	6.1	20 21.0	3 9.7	- 9 59.8	-0.0214	0.5743	0.0626	+20	-38
ω^2 Scorpii	5	3.59	6.1	20 33.0	3 24.6	- 9 45.4	+0.1746	0.5744	0.0620	+31	-27
B. A. C. 5395	6	+3.60	- 5.5	-21 5.9	6 5.8	- 7 10.1	+0.5925	0.5754	-0.0558	+58	- 4
ψ Ophiuchi	5	3.55	4.7	19 45.7	10 34.0	- 2 51.6	-1.0476	0.5770	0.0455	-42	-90
ω Ophiuchi	5	3.58	3.9	21 12.8	13 56.8	+ 0 23.8	+0.3308	0.5782	0.0404	+38	-19
B. A. C. 5567	6	3.53	3.4	20 10.7	17 31.9	+ 3 51.0	-0.8861	0.5793	0.0328	-32	-90
B. A. C. 5663	6½	3.51	2.4	20 13.0	22 56.4	+ 9 3.6	-0.9903	0.5809	0.0210	-40	-90
Lalande 30971	6½	+3.49	- 1.4	-20 13.1	5 3 16.5	-10 45.9	-0.0119	0.5819	-0.0117	+16	-37
B. A. C. 5758	6	3.51	1.2	21 24.0	4 16.0	- 9 48.7	+0.1669	0.5821	0.0094	+25	-38
Yarnall 7137	6½	3.47	- 0.5	20 49.9	7 54.3	- 6 18.5	-0.4474	0.5827	-0.0014	- 9	-67
ξ Ophiuchi	5	3.47	+ 0.2	20 59.1	10 26.2	- 3 52.2	-0.2837	0.5831	+0.0042	0	-55
B. A. C. 5866	6	3.47	0.5	21 19.8	11 58.8	- 2 23.1	+0.0851	0.5833	0.0096	+21	-32
B. A. C. 5954	6	+3.43	+ 1.9	-21 50.4	17 48.6	+ 3 13.7	+0.6988	0.5839	+0.0207	+66	+ 3
58 Ophiuchi	5	3.41	2.2	21 37.4	19 45.7	+ 5 6.4	+0.5166	0.5841	0.0250	+50	- 8
B. A. C. 5992	6½	3.42	2.4	22 8 4	20 8.7	+ 5 28.6	+1.0629	0.5841	0.0259	+68	+30
B. A. C. 6081	6	3.32	3.3	20 19.7	6 2 39.3	+11 44.6	-0.6042	0.5842	0.0403	-14	-82
B. A. C. 6098	6	3.32	3.6	20 44.1	3 44.0	-11 13.1	-0.1374	0.5842	0.0426	+11	-46
Yarnall 7631	6½	+3.32	+ 4.0	-21 27.2	5 36.7	- 9 24.7	+0.6915	0.5842	+0.0468	+66	+ 2
μ Sagittarii	4	3.28	4.5	21 5.2	8 20.8	- 6 46.8	+0.4467	0.5840	0.0528	+47	12
14 Sagittarii	6	3.30	4.6	21 44.5	8 32.5	- 6 35.5	+1.1353	0.5840	0.0531	+69	+36
15 Sagittarii	5	3.27	4.5	20 45.6	8 57.3	- 6 11.6	+0.1415	0.5840	0.0541	+28	-29
16 Sagittarii	6	3.27	4.5	20 25.2	8 57.8	- 6 11.2	-0.2099	0.5840	0.0541	+ 9	-50
21 Sagittarii	5	+3.22	+ 5.3	-20 36.1	13 9.9	- 2 8.5	+0.2234	0.5837	+0.0631	+34	-25
B. A. C. 6347	6½	3 16	6.4	21 9.0	18 47.2	+ 3 16.2	+1.1763	0.5830	0.0751	+69	+41
Yarnall 7918	6	3.11	6.3	19 23.6	20 29.7	+ 4 54.9	-0.5040	0.5828	0.0787	- 5	-72
Yarnall 7942	6	3.11	6.5	19 43.6	21 46.7	+ 6 9.0	-0.0584	0.5826	0.0813	+19	-41
Yarnall 7955	6	3.10	6.9	20 23.9	22 32.2	+ 6 52.8	+0.6977	0.5824	0.0828	+69	+ 2
29 Sagittarii	6	+3 10	+ 7.0	-20 27.3	23 17.0	+ 7 36.0	+0.8177	0.5823	+0.0845	+70	+10
Yarnall 8035	6½	3.03	7.3	19 18.3	7 2 36.8	+10 48.3	-0.0746	0.5817	0.0943	+19	-42
Yarnall 8088	6	3.00	7.5	19 16.2	4 55.4	-10 58.2	+0.1054	0.5813	0.0960	+30	-31
Yarnall 8122	6½	2.98	7.7	18 55.0	6 36.9	- 9 20.6	-0.0928	0.5809	0.0994	+19	-43
B. A. C. 6536	6	2.98	7.9	19 28.3	7 4.9	- 8 53.6	+0.5249	0.5809	0.1003	+57	- 8
d Sagittarii	5	+2.92	+ 8.4	-19 9.6	11 0.8	- 5 6.4	+0.6134	0.5800	+0.1080	+64	- 3
ρ^1 Sagittarii	4	2.88	8.3	18 3.9	12 44.1	- 3 27.0	-0.3208	0.5796	0.1113	+ 8	-57
ρ^2 Sagittarii	5½	2.89	8.4	18 31.4	12 47.6	- 3 23.6	+0.1554	0.5796	0.1113	+34	-29
B. A. C. 6658	6	2.86	8.9	18 35.6	15 25.4	- 0 51 6	+0.5274	0.5790	0.1165	+59	- 8
e^1 Sagittarii	6	2.76	9.1	16 33.6	20 48.0	+ 4 19.2	-0.9038	0.5776	0.1265	-24	-90
e^2 Sagittarii	5	+2.75	+ 9.1	-16 23.8	21 33.9	+ 5 3.4	-0.9741	0.5774	+0.1278	-29	-90
g Sagittarii	5½	2.64	9.7	15 48.0	8 4 8.4	+11 23.5	-0.7033	0.5754	0.1394	-10	-90
B. A. C. 6992	6½	2.50	10.5	15 9.2	13 55.9	- 3 10.3	+0.0810	0.5725	0.1553	+35	-33
β Capricorni	3	2.50	10.5	15 9.0	14 2.0	- 3 4.4	+0.0935	0.5725	0.1556	+35	-32
Yarnall 8844	6½	2.47	10.1	13 46.3	15 23.6	- 1 45.7	-1.0988	0.5721	0.1576	-35	-90
B. A. C. 7063	6	+2.44	+11.0	-15 26.8	18 22 4	+ 1 6.7	+1.0837	0.5712	+0.1620	+75	+29
B. A. C. 7087	5	2.40	10.7	14 7.4	19 44.6	+ 2 25.9	-0.0413	0.5708	0.1640	+29	-40
B. A. C. 7221	6½	2.29	10.7	12 58.7	9 2 56.0	+ 9 21.9	+0.0085	0.5688	0.1739	+32	-37
B. A. C. 7242	6	2.27	10.6	12 1.0	3 59.8	+10 23.4	-0.7834	0.5686	0.1752	-11	-90
8 Aquarii	6	2.24	11.4	13 30.4	6 57.7	-10 45.0	+1.2563	0.5678	0.1790	+77	+46
ν Aquarii	4½	+2.17	+11.0	-11 50.7	11 13.5	- 6 38.2	+0.3432	0.5666	+0.1842	+54	-19
14 Aquarii	6	+2.12	+10.5	- 9 42.3	14 12.8	- 3 37.2	-1.2103	0.5656	+0.1875	-50	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
17 Aquarii	6½	+2.08	+10.7	- 9 49.1	9 17 8.4	- 0 55.7	-0.6040	0.5652	+0.1906	+ 1	-79
19 Aquarii	6	2.07	10.9	10 14.8	18 8.4	+ 0 2.1	+0.0217	0.5650	0.1917	+35	-36
ξ Aquarii	4½	1.97	10.6	8 22.8	23 42.7	+ 5 24.7	-0.7868	0.5638	0.1970	- 9	-90
B. A. C. 7562	6½	1.95	11.1	9 34.5	10 2 53.3	+ 8 28.6	+1.0544	0.5632	0.1998	+81	+24
c^1 Capricorni	5½	1.95	11.1	9 37.2	2 55.6	+ 8 30.9	+1.1076	0.5632	0.1999	+81	+28
30 Aquarii	5½	+1.82	+10.6	- 7 5.4	11 6.2	- 7 35.5	+0.2083	0.5618	+0.2062	+18	-26
B. A. C. 7744	6	1.77	10.1	5 18.0	15 21.6	- 3 28.9	-0.7158	0.5613	0.2090	- 3	-90
44 Aquarii	5½	1.74	10.3	5 58.4	17 18.8	- 1 35.8	+0.3739	0.5610	0.2101	+59	-17
51 Aquarii	5½	1.71	10.2	5 25.9	20 27.6	+ 1 26.5	+0.4899	0.5606	0.2118	+68	-11
κ Aquarii	5	1.64	10.0	4 50.0	11 2 36.0	+ 7 22.3	+1.1962	0.5602	0.2145	+85	+36
3 Piscium	6	+1.54	+ 8.7	- 0 26.7	12 54.7	- 6 40.2	-0.9998	0.5600	+0.2173	-20	-90
B. A. C. 8152	6½	1.39	8.5	- 0 21.3	23 12.1	+ 3 16.0	+1.1513	0.5603	0.2179	+32	-90
κ Piscium	4½	1.40	8.3	+ 0 36.7	12 0 44.1	+ 4 44.8	+0.5109	0.5605	0.2178	+70	-10
9 Piscium	6½	1.40	8.3	0 28.6	0 52.8	+ 4 53.2	+0.6790	0.5605	0.2178	+86	0
15 Piscium	6½	1.35	8.1	0 39.8	4 34.6	+ 8 27.3	+1.2948	0.5609	0.2174	+90	+48
16 Piscium	6	+1.35	+ 7.9	+ 1 26.9	4 59.5	+ 8 51.4	+0.5938	0.5610	+0.2174	+77	- 5
19 Piscium	6	1.31	7.3	2 50.0	9 28.1	-10 49.3	+0.1695	0.5615	0.2163	+47	-28
22 Piscium	6½	1.28	7.5	2 16.6	11 57.4	- 8 25.1	+1.2679	0.5620	0.2155	+90	+44
d Piscium	5½	1.21	5.6	7 32.2	13 0 41.7	+ 3 52.8	-1.3186	0.5647	0.2096	-53	-83
45 Piscium	6	1.18	5.7	7 2.4	2 37.0	+ 6 3.3	-0.3476	0.5652	0.2082	+18	-57
51 Piscium	6½	+1.15	+ 5.8	+ 6 18.3	5 54.6	+ 8 54.7	+1.0067	0.5659	+0.2062	+90	+22
Yarnall 585	6½	1.06	4.4	9 16.8	21 39.0	+ 0 5.8	+1.1511	0.5703	0.1922	+90	+36
π Piscium	6	1.00	3.3	11 32.3	14 10 2.8	-11 57.1	+1.1663	0.5742	0.1777	+90	+39
104 Piscium	6½	1.01	2.8	13 41.3	10 56.8	-11 5.1	-0.8503	0.5744	0.1765	-11	-77
19 Arietis	6	0.95	+ 2.0	14 43.6	15 1 18.8	+ 2 45.7	+0.4852	0.5787	0.1544	+69	- 4
				NEW	*MOON.*						
JUPITER				+20 44.4	17 7 23.7	+ 6 49.6	+0.0006	0.5754	+0.0464	+38	-19
ι Tauri	5	+1.00	- 3.2	21 25.1	23 53.5	- 1 17.5	-0.2022	0.5855	0.0652	+27	-32
l Tauri	5½	1.00	3.4	20 15.6	18 1 53.8	+ 0 38.5	+1.0285	0.5813	0.0079	+90	+44
105 Tauri	6	+1.01	- 3.3	+21 32.8	1 54.9	+ 0 39.5	-0.3176	0.5813	+0.0077	+19	-34
n Tauri	6	1.03	3.7	21 58.4	6 40.7	+ 5 14.7	-0.7541	0.5798	-0.0026	- 7	-68
ο Tauri	6	1.05	3.9	21 50.9	10 12.8	+ 8 39.0	-0.6318	0.5786	0.0101	+ 1	-58
B. A. C. 1733	6½	1.04	4.3	20 23.2	12 47.5	+11 8.1	+0.8682	0.5775	0.0157	+90	+32
ζ Tauri	3½	1.06	4.4	21 4.1	14 28.8	-11 14.3	+0.1103	0.5769	0.0193	+44	-11
B. A. C. 1835	6½	+1.08	- 4.7	+20 49.5	19 4.0	- 6 49.0	+0.2564	0.5749	-0.0290	+53	- 4
B. A. C. 1867	6½	1.08	5.0	20 16.1	21 12.2	- 4 45.5	+0.7773	0.5740	0.0334	+90	+25
χ^1 Orionis	4½	1.08	5.0	20 15.1	21 40.4	- 4 18.3	+0.7794	0.5738	0.0344	+90	+25
χ^3 Orionis	5	1.11	5.4	19 41.4	19 1 35.4	- 0 31.8	+1.2266	0.5719	0.0425	+90	+60
χ^4 Orionis	5	1.11	5.3	20 8.3	1 46.9	- 0 20.7	+0.7427	0.5718	0.0429	+90	+22
68 Orionis	6	+1.13	- 5.6	+19 48.8	5 18.6	+ 3 3.4	+0.9247	0.5700	-0.0499	+90	+33
B. A. C. 2039	6½	1.16	5.7	21 15.0	9 21.7	+ 6 58.0	-0.8162	0.5679	0.0579	-11	-69
15 Geminorum	6	1.18	5.9	20 51.5	12 12.0	+ 9 42.2	-0.5771	0.5663	0.0634	+ 4	-58
16 Geminorum	6	1.18	6.0	20 33.9	12 16.8	+ 9 47.0	-0.2682	0.5662	0.0635	+22	-36
ν Geminorum	4½	1.19	6.1	20 17.0	12 44.1	+10 13.0	+0.0021	0.5660	0.0643	+37	-21
B. A. C. 2432	6½	+1.33	- 8.2	+18 29.7	20 13 17.5	+ 9 56.5	-0.2029	0.5516	-0.1071	+26	-37
Lalande 14620	6	1.35	8.7	17 19.5	17 23.4	-10 5.7	+0.6108	0.5490	0.1134	+82	+ 7
f Geminorum	6	1.38	8.8	17 56.4	20 59.5	- 6 36.7	-0.4731	0.5468	0.1187	+11	-55
1 Cancri	6	1.45	9.7	16 6.1	21 5 23.5	+ 1 31.0	+0.4730	0.5416	0.1305	+69	- 3
5 Cancri	6	1.46	9.8	16 46.6	7 33.2	+ 3 36.6	-0.5464	0.5403	0.1334	+ 7	-62
Yarnall 3294	6½	+1.47	-10.4	+14 41.4	10 46.8	+ 6 44.0	+1.2885	0.5384	-0.1375	+90	+59
20 Cancri	6	1.56	11.1	14 35.8	20 54.2	- 7 27.5	-0.0625	0.5327	0.1495	+34	-34
B. A. C. 2872	6½	1.58	11.5	13 39.5	23 28.8	- 4 57.5	+0.5892	0.5314	0.1523	+77	0
A^1 Cancri	6	1.61	12.0	13 6.0	22 4 14.2	- 0 21.0	+0.4513	0.5288	0.1574	+66	- 7
A^2 Cancri	6	1.61	12.2	12 32.3	6 8.1	+ 1 29.5	+0.7658	0.5279	0.1593	+90	+10
60 Cancri	6	+1.66	-12.5	+12 4.4	10 42.8	+ 5 55.9	+0.5394	0.5257	-0.1636	+73	- 3
α Cancri	4	+1.67	-12.6	+12 18.6	12 0.8	+ 7 11.5	+0.0653	0.5250	-0.1648	+41	-29

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S
		s	″	° ′	d h m	h m				°	°
κ Cancri	5	+1.70	-13.0	+11 8.3	22 16 47.7	+11 49.9	+0.5550	0.5227	-0.1689	+74	- 3
B. A. C. 3122	6½	1.71	12.8	12 2.4	17 50.7	-11 8.9	-0.6146	0.5222	0.1698	+ 4	-73
ω Leonis	6	1.80	14.0	9 34.0	23 3 35.4	- 1 41.4	+0.4175	0.5182	0.1772	+63	-12
h Leonis	6	1.81	13.8	10 13.9	5 25.4	+ 0 5.4	-0.6423	0.5175	0.1785	+ 2	-76
B. A. C. 3336	5	1.87	15.1	7 14.9	12 58.4	+ 7 25.4	+1.2829	0.5151	0.1834	+90	+49
B. A. C. 3438	6½	+1.95	-15.9	+ 5 34.3	22 56.0	- 6 51.2	+1.2838	0.5124	-0.1887	+90	+48
14 Sextantis	6	1.97	15.6	6 10.9	24 0 0.0	- 5 51.9	+0.4076	0.5122	0.1891	+62	-14
16 Sextantis	6	1.98	15.4	6 44.7	1 18.7	- 4 35.4	-0.4626	0.5119	0.1897	+12	-65
19 Sextantis	6½	1.99	16.1	5 11.6	3 14.7	- 2 42.7	+0.8859	0.5115	0.1906	+90	+13
Yarnall 4339	6½	2.07	16.4	4 31.7	10 37.7	+ 4 27.8	+0.2044	0.5104	0.1934	+50	-26
34 Sextantis	6	+2.17	-16.5	+ 4 11.7	19 22.9	-11 1.8	-1.1306	0.5095	-0.1958	-30	-86
36 Sextantis	6	2.18	16.9	3 6.2	20 45.7	- 9 41.2	-0.1942	0.5093	0.1961	+27	-48
B. A. C. 3726	6	2.21	17.4	1 38.8	25 0 36.5	- 5 56.9	+0.6617	0.5092	0.1969	+84	- 1
55 Leonis	6	2.23	17.5	1 21.6	2 29.5	- 4 7.0	+0.6064	0.5092	0.1972	+79	- 4
B. A. C. 3779	6	2.29	17.9	0 6.5	6 30.7	- 0 12.6	+1.1967	0.5091	0.1977	+90	+36
p^2 Leonis	6	+2.29	-17.7	+ 0 37.8	6 47.9	+ 0 4.2	+0.5641	0.5091	-0.1977	+74	- 7
p^5 Leonis	5	2.33	17.6	+ 0 34.0	12 18.6	+ 5 25.6	-0.4580	0.5093	0.1982	+13	-66
B. A C. 3901	6	2.41	18.0	- 1 3.3	19 58.4	-11 7.5	-0.1833	0.5100	0.1981	+27	-48
B. A. C. 3903	6½	2.41	17.8	0 15.2	20 3.3	-11 2.8	-1.0857	0.5100	0.1981	-26	-90
B. A. C. 3909	6	2.40	17.8	0 12.3	20 47.1	-10 20.1	-1.2841	0.5102	0.1981	-46	-90
c Leonis	4½	+2.43	-18.5	- 2 21.5	21 16.8	- 9 51.3	+0.9945	0.5102	-0.1981	+88	+19
B. A. C. 3955	5½	2.47	18.2	1 47.3	26 1 38.6	- 5 36.9	-0.4966	0.5109	0.1976	+11	-69
B. A. C. 4006	6	2.56	18.8	4 41.0	8 26.4	+ 0 59.1	+1.3521	0.5124	0.1965	+86	+60
B. A. C. 4201	6½	2.78	18.9	8 1.6	27 4 0.8	- 3 59.8	+1.2260	0.5186	0.1904	+82	+40
χ Virginis	5	2.85	18.4	7 21.1	9 53.9	+ 1 43.0	-0.6265	0.5210	0.1876	+ 2	-81
B. A. C. 4259	6	+2.85	-18.4	- 7 23.3	9 58.4	+ 1 47.4	-0.5994	0.5211	-0.1875	+ 3	-78
B. A. C. 4312	6½	2.93	18.7	9 42.1	16 8.9	+ 7 46.9	+0.7807	0.5239	0.1840	+81	+ 6
ψ Virginis	5	2.94	18.3	8 54.2	17 40.8	+ 9 16.0	-0.3714	0.5246	0.1830	+15	-60
g Virginis	6	3.03	17.9	10 6.9	28 0 33.8	- 8 3.4	-0.2946	0.5280	0.1782	+18	-55
50 Virginis	6	3.03	17.7	9 42.3	1 30.4	- 7 8.4	-0.9082	0.5285	0.1776	-17	-90
a Virginis	1	+3.13	-17.2	-10 33.0	9 14.2	+ 0 21.3	-1.3354	0.5328	-0.1713	-67	-90
i Virginis	5½	3.16	17.5	12 5.9	9 59.2	+ 1 4.9	+0.2153	0.5331	0.1706	+45	-26
B. A. C. 4531	6	3.21	17.2	12 36.8	13 54.8	+ 4 53.1	+0.1107	0.5354	0.1671	+39	-31
B. A. C. 4679	6½	3.40	15.9	14 24.5	29 4 18.7	- 5 10.2	-0.2536	0.5442	0.1519	+17	-53
B. A. C. 4700	5½	3.43	15.6	15 44.9	7 19.5	- 2 15.4	+0.7347	0.5462	0.1482	+74	+ 4
B. A. C. 4896	6	+3.62	-12.8	-17 18 1	30 2 10.1	- 8 2.3	-0.1720	0.5585	-0.1220	+18	-48
ι^1 Libræ	4½	3.75	11.4	19 20.8	11 23.7	+ 0 52.4	+0.9477	0.5644	0.1072	+71	+19
ι^2 Libræ	6	3.75	11.2	19 12.3	11 53.2	+ 1 20.9	+0.7447	0.5647	0.1064	+71	+ 5
28 Libræ	6	3.74	10 5	17 43.9	15 15.3	+ 4 35.9	-1.1625	0.5668	0.1005	-47	-90
B. A. C. 5109	6½	3.82	9.6	19 16.2	20 21.5	+ 9 31.4	-0.0273	0.5699	0.0915	+22	-39
41 Libræ	6	+3.83	- 9.1	-18 54.9	23 5.7	-11 50.3	-0.6443	0.5715	-0.0864	-12	-87
κ Libræ	5	3.85	8.8	19 17.9	31 0 24.6	-10 34.2	-0.3524	0 5723	0.0840	+ 4	-60
λ Libræ	6	3.88	7.9	19 48.9	5 17.8	- 5 51.6	-0.1940	0.5752	0.0744	+12	-49
B. A. C. 5278	6	3.93	7.7	21 8.6	6 55.7	- 4 17.2	+1.0809	0.5762	0.0711	+69	+31
B. A. C. 5281	6	3.89	7.4	20 38.5	7 8.1	- 4 5.2	+0.5398	0.5763	0.0707	+55	- 7
β^1 Scorpii	2	+3.88	- 6 7	-19 29.0	10 27.6	- 0 52.9	-0.8989	0.5780	-0.0641	-30	-90
β^2 Scorpii	5½	3.88	6.7	19 28.8	10 27.7	- 0 52.8	-0.9020	0.5780	0.0641	-30	-90
B. A C. 5333	6½	3.88	6.7	19 21.6	10 35.6	- 0 45.3	-1.0368	0.5781	0.0639	-40	-90
ω^1 Scorpii	4½	3.91	6.6	20 21.0	11 1.5	- 0 20.3	-0.0265	0.5783	0.0630	+20	-38
ω^2 Scorpii	5	3.91	6.6	20 33.0	11 16.2	- 0 6.2	+0.1679	0.5784	0.0625	+30	-28
B. A. C. 5395	6	+3.93	- 6.0	-21 5.9	13 55.1	+ 2 26.9	+0.5834	0.5797	-0.0572	+57	- 4
ψ Ophiuchi	5	3.92	5.0	19 45.7	18 19.3	+ 6 41.4	-1.0450	0.5818	0.0478	-42	-90
ω Ophiuchi	5	+3.97	- 4.3	-21 12.8	21 39.0	+ 9 53.7	+0.3240	0.5832	-0 0406	+38	-19

JUNE.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S
B. A. C. 5567	6	+3.95	- 3.3	-20 10.7	1 1 10.6	-10 42.6	-0.8835	0.5845	-0.0330	-32	-90
B. A. C. 5663	6½	+3.96	- 2.3	-20 13.0	6 29.5	- 5 35.6	-0.9865	0.5864	-0.0212	-40	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
Lalande 30971	6½	+3.96	- 1.1	-20 13.1	1 10 44.9	- 1 29.9	-1.0527	0.5878	-0.0116	-46	-90
B. A. C. 5758	6	4.00	1.0	21 24.0	11 43.3	- 0 33.6	+0.1612	0.5880	0.0095	+25	-28
Yarnall 7137	6½	3.98	- 0.1	20 49.9	15 17.5	+ 2 52.5	-0.4475	0.5889	-0.0014	- 9	-67
ξ Ophiuchi	5	3.99	+ 0.5	20 59.1	17 46.5	+ 5 15.8	-0.2851	0.5895	+0.0042	0	-55
B. A. C. 5866	6	3.99	0.9	21 19.8	19 17.2	+ 6 43.0	+0.0806	0.5899	0.0077	+20	-33
B. A. C. 5954	6	+4.00	+ 2.2	-21 50.4	2 1 0.0	-11 47.3	+0.6881	0.5906	+0.0206	+64	+ 2
58 Ophiuchi	5	3.99	2.7	21 37.4	2 54.7	- 9 57.0	+0.5072	0.5908	0.0251	+49	- 9
B. A. C. 5992	6½	4.00	2.8	22 8.4	3 17.2	- 9 35.4	+1.0486	0.5909	0.0260	+68	+28
B. A. C. 6081	6	3.92	4.2	20 19.6	9 39.6	- 3 27.6	-0.6033	0.5912	0.0406	-14	-82
B. A. C. 6098	6	3.93	4.4	20 44.1	10 42.9	- 2 26.7	-0.1409	0.5913	0.0430	+11	-46
Yarnall 7631	6½	+3.94	+ 4.9	-21 27.2	12 33.2	- 0 40.7	+0.6797	0.5913	+0.0472	+66	+ 2
μ Sagittarii	4	3.91	5.5	21 5.2	15 13.8	+ 1 53.7	+0.4376	0.5913	0.0532	+46	-13
14 Sagittarii	6	3.93	5.5	21 44.5	15 25.2	+ 2 4.8	+1.1194	0.5913	0.0537	+69	+35
15 Sagittarii	5	3.91	5.5	20 45.6	15 49.5	+ 2 28.1	+0.1350	0.5913	0.0546	+27	-29
16 Sagittarii	6	3.90	5.5	20 25.2	15 50.0	+ 2 28.5	-0.2133	0.5913	0.0546	+ 8	-50
21 Sagittarii	5	+3.88	+ 6.4	-20 36.1	19 56.6	+ 6 25.7	+0.2159	0.5910	+0.0638	+33	-25
B. A. C. 6292	6	3.81	6.8	18 58.8	22 24.5	+ 8 47.9	-1.2794	0.5908	0.0692	-69	-90
B. A. C. 6347	6½	3.85	7.8	21 9.0	3 1 26.7	+11 43.3	+1.1593	0.5904	0.0758	+69	+39
Yarnall 7918	6	3.80	7.9	19 23.6	3 6.9	-10 40.3	-0.5054	0.5902	0.0795	- 5	-72
Yarnall 7942	6	3.79	8.2	19 43.5	4 22.2	- 9 27.9	-0.0644	0.5899	0.0823	+19	-41
Yarnall 7955	6	+3.80	+ 8.5	-20 23.9	5 6.7	- 8 45.1	+0.6845	0.5898	+0.0839	+68	+ 2
29 Sagittarii	6	3.79	8.6	20 27.3	5 50.6	- 8 2.9	+0.8042	0.5897	0.0852	+70	+ 9
Yarnall 8035	6½	3.74	9.2	19 18.2	9 6.2	- 4 54.8	-0.0810	0.5891	0.0924	+19	-42
Yarnall 8088	6	3.72	9.5	19 16.1	11 21.8	- 2 44.3	+0.0977	0.5885	0.0971	+29	-31
Yarnall 8122	6½	3.70	9.8	18 54.9	13 1.2	- 1 8.7	-0.0994	0.5881	0.1005	+19	-43
B. A. C. 6536	6	+3.71	+10.0	-19 28.3	13 28.5	- 0 42.4	+0.5129	0.5880	+0.1014	+56	- 9
d Sagittarii	5	3.66	10.6	19 9.5	17 19.5	+ 2 59.8	+0.5997	0.5869	0.1093	+63	- 4
ρ¹ Sagittarii	4	3.62	10.7	18 3.9	19 0.6	+ 4 37.1	-0.3262	0.5865	0.1127	+ 8	-58
ρ² Sagittarii	5½	3.63	10.8	18 31.4	19 4.0	+ 4 40.4	+0.1459	0.5864	0.1128	+34	-29
B. A. C. 6658	6	3.62	11.3	18 35.6	21 38.7	+ 7 9.2	+0.5144	0.5857	0.1179	+57	- 9
e¹ Sagittarii	6	+3.52	+11.7	-16 33.6	4 2 54.8	-11 46.6	-0.9057	0.5841	+0.1281	-24	-90
e² Sagittarii	5	3.51	11.9	16 23.7	3 39.8	-11 3.3	-0.9757	0.5839	0.1293	-29	-90
g Sagittarii	5½	3.42	12.8	15 48.0	10 6.8	- 4 50.7	-0.7081	0.5818	0.1410	-10	-90
B. A. C. 6992	6½	3.30	14.1	15 9.1	19 44.2	+ 4 25.4	+0.0684	0.5782	0.1566	+34	-33
β Capricorni	3	3.30	14.1	15 8.9	19 50.2	+ 4 31.2	+0.0808	0.5781	0.1568	+35	-33
Yarnall 8844	6½	+3.26	+13.9	-13 46.2	21 10.5	+ 5 48.5	-1.1043	0.5776	+0.1588	-35	-90
B. A. C. 7063	6	3.25	14.7	15 26.7	5 0 6.7	+ 8 38.3	+1.0649	0.5765	0.1633	+75	+27
B. A. C. 7087	5	3.21	14.6	14 7.3	1 27.5	+ 9 56.1	-0.0540	0.5760	0.1653	+28	-41
B. A. C. 7221	6½	3.12	15.1	12 58.6	8 33.0	- 7 13.8	-0.0056	0.5733	0.1752	+32	-38
B. A. C. 7242	6	3.09	15.0	12 0.9	9 36.0	- 6 13.1	-0.7941	0.5729	0.1766	-11	-90
8 Aquarii	6	+3.07	+15.4	-13 30.3	12 31.7	- 3 23.7	+1.2357	0.5716	+0.1802	+77	+43
ν Aquarii	4½	3.00	15.5	11 50.7	16 44.8	+ 0 40.4	+0.3264	0.5700	0.1852	+52	-19
14 Aquarii	6	2.94	15.3	9 42.2	19 42.3	+ 3 31.6	-1.2868	0.5689	0.1884	-54	-90
17 Aquarii	6½	2.91	15.4	9 49.0	22 36.4	+ 6 19.5	-0.6187	0.5679	0.1915	+ 1	-80
19 Aquarii	6	2.90	15.6	10 14.8	23 36.0	+ 7 17.0	+0.0048	0.5675	0.1924	+34	-37
ξ Aquarii	4½	+2.81	+15.3	- 8 22.7	6 5 7.9	-11 22.6	-0.8024	0.5657	+0.1978	-10	-90
B. A. C. 7562	6½	2.79	15.9	9 34.3	8 17.5	- 8 19.8	+1.0347	0.5648	0.2004	+81	+23
c¹ Capricorni	5½	2.79	15.9	9 37.2	8 19.7	- 8 17.8	+1.0877	0.5647	0.2005	+81	+27
30 Aquarii	5½	2.67	15.5	7 5.3	16 28.8	- 0 25.5	+0.1892	0.5624	0.2066	+47	-27
B. A. C. 7744	6	2.60	15.1	5 17.9	20 43.9	+ 3 40.7	-0.7359	0.5613	0.2091	- 4	-90
44 Aquarii	5½	+2.58	+15.5	- 5 58.3	22 41.1	+ 5 33.9	+0.3539	0.5608	+0.2102	+57	-18
51 Aquarii	5½	2.54	15.3	5 25.8	7 1 50.1	+ 8 36.3	+0.4701	0.5601	0.2117	+66	-12
κ Aquarii	5	2.46	15.2	4 49.9	7 59.6	- 9 26.8	+1.1773	0.5589	0.2141	+85	+34
3 Piscium	6	2.33	13.8	0 26.6	18 22.0	+ 0 34.4	-1.0249	0.5575	0.2163	-22	-90
B. A. C. 8152	6½	2.21	13.7	- 0 21.2	8 4 45.5	+10 36.7	-1.1342	0.5568	0.2165	-30	-90
κ Piscium	4½	+2.20	+13.4	+ 0 36.8	6 18.6	-11 53.3	+0.4910	0.5568	+0.2163	+68	-11
9 Piscium	6½	+2.20	+13.4	+ 0 28.7	6 27.3	-11 44.9	+0.6595	0.5568	+0.2161	+84	- 2

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					LIMITING PARALLELS.	
Name.	Mag.	Red'ns from 1882.0. $\Delta\alpha$	Red'ns from 1882.0. $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
15 Piscium	6½	+2.14	+13.2	+ 0 39.9	8 10 12.1	- 8 7.8	+1.2800	0.5569	+0.2157	+90	+46
16 Piscium	6	2.15	13.0	1 27.0	10 37.2	- 7 43.5	+0.5742	0.5569	0.2156	+75	- 6
19 Piscium	6	2.10	12.3	2 50.1	15 9.8	- 3 20.2	+0.1478	0.5570	0.2145	+46	-29
22 Piscium	6½	2.06	12.4	2 16.7	17 41.2	- 0 54.0	+1.2534	0.5571	0.2136	+90	+43
45 Piscium	6	1.93	10.1	7 2.5	9 8 56.9	-10 9.4	-0.3731	0.5588	0.2059	+17	-58
51 Piscium	6½	+1.91	+10.3	+ 6 18.4	11 58.0	- 7 14.5	+0.9926	0.5593	+0.2039	+90	+21
Yarnall 585	6½	1.76	8.3	9 16.8	10 4 3.0	+ 8 17.3	+1.1408	0.5631	0.1899	+90	+34
π Piscium	6	1.67	6.5	11 32.4	16 44.4	- 3 27.9	+1.1590	0.5664	0.1755	+90	+38
104 Piscium	6½	1.68	5.9	13 41.3	17 39.7	- 2 34.6	-0.8776	0.5667	0.1743	-12	-77
19 Arietis	6	1.56	4.6	14 43.6	11 8 22.6	+11 37.1	+0.4742	0.5708	0.1536	+68	- 5
27 Arietis	6	+1.54	+ 3.4	+17 11.0	16 2.8	- 4 59.2	-0.9179	0.5733	+0.1414	-16	-73
40 Arietis	6½	1.50	2.6	17 47.5	23 35.0	+ 2 16.7	-0.5302	0.5753	0.1285	+ 8	-60
π Arietis	6	1.48	2.7	16 58.4	23 55.2	+ 2 36.2	+0.3567	0.5754	0.1279	+60	- 8
ρ^2 Arietis	6	1.47	2.5	17 51.2	12 2 41.0	+ 5 15.9	-0.2042	0.5760	0.1230	+26	-38
ρ^3 Arietis	6	1.47	2.3	17 33.1	2 56.4	+ 5 30.8	+0.1379	0.5761	0.1225	+46	-19
53 Arietis	6	+1.43	+ 1.9	+17 25.4	7 37.8	+10 1.9	+0.8254	0.5772	+0.1138	+90	+20
54 Arietis	6½	1.44	1.7	18 20.5	8 0.2	+10 23.5	-0.0810	0.5773	0.1131	+33	-30
δ Arietis	4½	1.44	1.4	19 16.8	9 22.3	+11 42.6	-0.8980	0.5775	0.1105	-15	71
13 Tauri	6½	1.37	+ 0.2	19 19.3	22 19.9	+ 0 11.7	+0.3264	0.5798	0.0850	+58	- 5
B. A. C. 1143	6½	1.38	0.0	20 33.2	23 12.8	+ 1 4.3	-0.8788	0.5798	0.0846	-14	-70
B. A. C. 1242	6½	+1.34	- 0.7	+19 52.0	13 6 13.3	+ 7 47.7	+0.3654	0.5806	+0.0687	+61	- 2
A^2 Tauri	6	1.34	0.9	20 41.3	7 57.0	+ 9 27.5	-0.3753	0.5807	0.0650	+16	-43
ω^1 Tauri	6	1.32	0.9	19 17.8	9 36.6	+11 3.5	+1.1820	0.5808	0.0615	+90	+54
ω^2 Tauri	5½	1.32	1.3	20 17.2	12 59.9	- 9 40.7	+0.3454	0.5809	0.0545	+59	- 1
JUPITER				21 45.9	14 3 7.6	+ 3 45.8	-0.6510	0.5705	+0.0224	0	-61
				NEW	*MOON.*						
B. A. C. 2432	6½	+1.27	- 8.1	+18 29.7	16 21 46.2	- 3 47.0	-0.1580	0.5540	-0.1070	+28	-32
Lalande 14620	6	1.28	8.5	17 19.5	17 1 50.7	+ 0 9.3	+0.6574	0.5516	0.1134	+87	+10
f Geminorum	6	1.29	8.6	17 56.4	5 25.6	+ 3 37.1	-0.4235	0.5480	0.1188	+14	-52
1 Cancri	6	+1.31	- 9.3	+16 6.1	13 46.3	+11 41.6	+0.5273	0.5448	-0.1306	+73	0
5 Cancri	6	1.33	9.3	16 46.6	15 55.1	-10 13.7	-0.4901	0.5435	0.1336	+10	-58
29 Cancri	6	1.38	10.4	14 35.8	18 5 10.1	+ 2 36.2	+0.0012	0.5360	0.1499	+37	-31
B. A. C. 2872	6½	1.40	10.6	13 39.5	7 43.5	+ 5 4.9	+0.6398	0.5347	0.1527	+85	+ 4
A^1 Cancri	6	1.42	11.0	13 6.0	12 26.7	+ 9 39.4	+0.5183	0.5320	0.1578	+72	- 4
A^2 Cancri	6	+1.42	-11.2	+12 32.3	14 19.7	+11 28.9	+0.8335	0.5310	-0.1597	+90	+14
60 Cancri	6	1.45	11.5	12 4.4	18 52.2	- 8 6.9	+0.6101	0.5287	0.1641	+80	+ 1
α Cancri	4	1.46	11.6	12 18.6	20 9.7	- 6 51.7	+0.1374	0.5281	0.1653	+45	-25
κ Cancri	5	1.48	11.9	11 8.3	19 0 54.5	- 2 15.5	+0.6285	0.5258	0.1694	+82	+ 1
B. A. C. 3122	6½	1.49	11.7	12 2.4	1 56.0	- 1 15.8	-0.5363	0.5253	0.1708	+ 8	-67
ω Leonis	6	+1.55	-12.7	+ 9 34.0	11 37.7	+ 8 8.7	+0.4972	0.5209	-0.1778	+60	- 8
h Leonis	6	1.56	12.6	10 13.9	13 27.0	+ 9 54.8	-0.5607	0.5202	0.1790	+ 7	-70
14 Sextantis	6	1.70	14.1	6 11.0	20 7 55.7	+ 3 51.6	+0.4969	0.5138	0.1894	+60	- 9
16 Sextantis	6	1.71	13.9	6 44.7	9 14.1	+ 5 7.8	-0.3724	0.5134	0.1899	+17	-58
19 Sextantis	6½	1.72	14.4	5 11.6	11 9.8	+ 7 0.2	+0.0763	0.5129	0.1908	+90	+19
Yarnall 4339	6½	+1.79	-14.7	+ 4 31.7	18 31.6	- 9 50.5	+0.2978	0.5112	-0.1933	+55	-20
34 Sextantis	6	1.87	14.8	4 11.7	21 3 16.1	- 1 20.8	-1.0351	0.5096	0.1956	-22	-86
36 Sextantis	6	1.89	15.2	3 6.2	4 38.9	- 0 0.3	-0.0981	0.5094	0.1959	+32	-43
B. A. C. 3726	6	1.92	15.6	1 38.8	8 20.8	+ 3 44 1	+0.7598	0.5090	0.1966	+90	+ 4
55 Leonis	6	1.94	15.7	1 21.7	10 22.9	+ 5 34.0	+0.7047	0.5089	0.1969	+90	+ 1
B. A. C. 3779	6	+1.99	-16.1	+ 0 6.6	14 24.4	+ 9 28.8	+1.2969	0.5086	-0.1974	+90	+48
p^2 Leonis	6	2.00	16.0	0 37.8	14 41.6	+ 9 45.6	+0.6639	0.5086	0.1973	+85	- 1
p^5 Leonis	5	2.04	15.8	+ 0 34.1	20 13.1	- 8 52.2	-0.3584	0.5085	0.1976	+18	-59
B. A. C. 3901	6	2.13	16.2	- 1 3.3	22 3 54.7	- 1 23.4	-0.0833	0.5087	0.1975	+33	-42
B. A. C. 3903	6½	2.13	15.9	0 15.2	3 59.6	- 1 18.7	-0.9870	0.5087	0.1975	-19	-90
B. A. C. 3909	6	+2.13	-16.0	- 0 12.2	4 43.6	- 0 35.9	-1.1858	0.5088	-0.1974	-35	-90
e Leonis	4½	+2.15	-16.7	- 2 21.4	5 13.5	- 0 6.8	+1.0980	0.5088	-0.1974	+88	+27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 3955	5½	+2.19	-16.5	- 1 47.3	22 9 36.7	+ 4 9.0	-0.3964	0.5093	-0.1969	+16	-61
B. A. C. 4201	6½	2.52	17.5	8 1.6	23 12 11.6	+ 5 58.7	+1.3311	0.5153	0.1892	+82	+56
χ Virginis	5	2.59	16.9	7 21.0	18 8.4	+11 45.2	-0.5302	0.5173	0.1863	+ 7	-72
B. A. C. 4259	6	2.59	16.9	7 23.3	18 12.9	+11 49.6	-0.5033	0.5174	0.1862	+ 8	-70
B. A. C. 4312	6½	2 70	17.3	9 42.1	24 0 27.6	- 6 6.6	+0.8806	0.5199	0.1826	+81	+12
ψ Virginis	5	+2.70	-16.8	- 8 54.2	2 0.5	- 4 36.4	-0.2764	0.5206	-0.1817	+20	-54
g Virginis	6	2.80	16.6	10 6.8	8 58.5	+ 2 9.2	-0.2015	0.5238	0.1770	+23	-49
50 Virginis	6	2.81	16.4	9 42.2	9 55.7	+ 3 4.8	-0.8175	0.5243	0.1763	-11	-90
58 Virginis	6	2.86	16.1	9 55.7	13 51.2	+ 6 53.2	-1.2578	0.5263	0.1733	-48	-90
α Virginis	1	2.92	15.9	10 33.0	17 45.2	+10 40.2	-1.2494	0.5284	0.1701	-47	-90
i Virginis	5½	+2.95	-16.4	-12 5.9	18 30.8	+11 24.4	+0.3068	0.5288	-0.1695	+51	-20
B. A. C. 4531	6	3.01	16.1	12 36.8	22 29.3	- 8 44.5	+0.2001	0.5310	0.1660	+44	-26
B. A. C. 4679	6½	3.24	15.3	14 24.5	25 13 3.9	+ 5 22.9	-0.1726	0.5398	0.1512	+21	-48
B. A. C. 4700	5½	3.28	15.0	15 44.9	16 6.9	+ 8 20.0	+0.8166	0.5418	0.1475	+75	+ 9
B. A. C. 4896	6	3.55	12.4	17 18.1	26 11 9.5	+ 2 45.2	-0.0964	0.5549	0.1217	+22	-44
ι¹ Libræ	4½	+3.71	-11.4	-19 20.8	20 27.7	+11 44.3	+1.0094	0.5612	-0.1073	+71	+24
ι² Libræ	6	3.72	11.1	19 12.3	20 57.4	-11 47.0	+0.8050	0.5615	0.1065	+71	+ 8
26 Libræ	6½	3.69	10.6	17 19.8	21 32.5	-11 13.1	-1.2448	0.5619	0.1055	-57	-90
28 Libræ	6	3.73	10.1	17 43.9	27 0 21.0	- 8 30 4	-1.1064	0.5639	0.1007	-42	-90
B. A. C. 5109	6½	3.82	9.6	19 16.2	5 29.0	- 3 33.2	+0.0255	0.5678	0.0917	+25	-36
41 Libræ	6	+3.85	- 8.8	-18 54.9	8 14.1	- 0 53.9	-0.5940	0.5691	-0.0917	- 8	-81
κ Libræ	5	3.88	8.7	19 17.9	9 33.3	+ 0 22.5	-0.3033	0.5700	0.0843	+ 7	-56
λ Libræ	6	3.93	7.8	19 48.9	14 27.6	+ 5 6.2	-0.1487	0.5732	0.0750	+14	-46
B. A. C. 5278	6	3.98	7.8	21 8.6	16 5.7	+ 6 40.8	+1.1236	0.5744	0.0720	+69	+35
B. A. C. 5281	6	3.98	7.4	20 38.5	16 18.2	+ 6 52.9	+0.5828	0.5745	0.0715	+59	- 5
β¹ Scorpii	2	+3.98	- 6.5	-19 29.0	19 38.1	+10 5.6	-0.8576	0.5766	-0.0648	-27	-90
β² Scorpii	5½	3.98	6.5	19 28.8	19 38.2	+10 5.6	-0.8614	0 5766	0.0648	-27	-90
B. A. C. 5333	6½	3.98	6.5	19 21.6	19 46.1	+10 13.2	-0.9959	0.5767	0.0644	-37	-90
ω¹ Scorpii	4½	4.00	6.5	20 21.0	20 12.0	+10 38.2	+0.0131	0.5769	0.0638	+22	-37
ω² Scorpii	5	4.01	6.6	20 33.0	20 26.8	+10 52.4	+0.2072	0.5771	0.0632	+33	-25
B. A. C. 5395	6	+4.05	- 6.0	-21 5.9	23 5.8	-10 34.4	+0.6195	0.5787	-0.0579	+60	- 2
ψ Ophiuchi	5	4.06	4.8	19 45.7	28 3 30.0	- 6 20.0	-1.0097	0.5812	0.0488	-39	-90
ω Ophiuchi	5	4.12	4.3	21 12.8	6 49.4	- 3 7.9	+0.3527	0.5830	0.0415	+39	-18
B. A. C. 5567	6	4.12	3.1	20 10.7	10 20.4	+ 0 15.1	-0.8551	0.5848	0.0341	-30	-90
B. A. C. 5663	6½	4.16	2.1	20 13.0	15 38.1	+ 5 20.9	-0.9623	0.5870	0.0235	-38	-90
Lalande 30971	6½	+4.18	- 0.9	-20 13.1	19 52.1	+ 9 25.3	-1.0320	0.5891	-0.0128	-44	-90
B. A. C. 5758	6	4.23	- 0.8	21 24.0	20 50.1	+10 21.1	+0.1760	0.5895	0.0107	+26	-27
Yarnall 7137	6½	4.23	+ 0.1	20 49.9	29 0 22.7	-10 14.4	-0.4336	0.5907	-0.0025	- 8	-66
ξ Ophiuchi	5	4.25	0.8	20 59.1	2 50.5	- 7 52.3	-0.2748	0.5916	+0.0031	0	-54
B. A. C. 5954	6	4.30	2.7	21 50.4	9 59.7	- 0 59.6	+0.6850	0.5937	0.0198	+64	+ 2
58 Ophiuchi	5	+4.30	+ 3.1	-21 37.4	11 53.1	+ 0 49.4	+0.5035	0.5941	+0.0243	+48	- 9
B. A. C. 5992	6½	4.31	3.1	22 8.4	12 15.4	+ 1 10.8	+1.0409	0.5942	0.0251	+68	+28
B. A. C. 6081	6	4.28	4.8	20 19.6	18 32.8	+ 7 13.5	-0.6073	0.5954	0.0398	-15	-82
B. A. C. 6098	6	4.29	5.1	20 44.1	19 35.3	+ 8 13.6	-0.1493	0.5955	0.0421	+11	-46
Yarnall 7631	6½	4.31	5.5	21 27.2	21 23.9	+ 9 58.0	+0.6632	0.5957	0.0463	+64	+ 1
μ Sagittarii	4	+4.30	+ 6.2	-21 5.2	30 0 2.0	-11 30.2	+0.4197	0.5959	+0.0525	+45	-14
14 Sagittarii	6	4.32	6.1	21 44.5	0 13.3	-11 19.2	+1.0957	0.5960	0.0529	+69	+32
15 Sagittarii	5	4.30	6.3	20 45.6	0 37.2	-10 56.3	+0.1187	0.5960	0.0538	+26	-31
16 Sagittarii	6	4.29	6.3	20 25.2	0 37.7	-10 55.9	-0.2267	0.5960	0.0538	+ 8	-51
21 Sagittarii	5	4.29	7.3	20 36.1	4 40.2	- 7 2.8	+0.1941	0.5962	0.0632	+32	-26
B. A. C. 6347	6½	+4.30	+ 8.8	-21 8.9	10 4.2	- 1 51.4	+1.1228	0.5962	+0.0755	+69	+35
Yarnall 7918	6	4.26	9.1	19 23.6	11 42.6	- 0 16.8	-0.5289	0.5961	0.0792	- 6	-74
Yarnall 7942	6	4.26	9.4	19 43.5	12 56.5	+ 0 54.2	-0.0933	0.5961	0.0819	+17	-43
Yarnall 7955	6	4.28	9.6	20 23.9	13 40.1	+ 1 36.2	+0.6480	0.5961	0.0836	+65	- 1
29 Sagittarii	6	4.28	9.8	20 27.3	14 23.1	+ 2 17.4	+0.7649	0.5960	0.0853	+70	+ 7
Yarnall 8035	6½	+4.25	+10.6	-19 18.2	17 34.7	+ 5 21.5	-0.1151	0.5959	+0.0923	+17	-44

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
d Sagittarii	5	+4.20	+12.4	-19 9.5	1 1 37.1	-10 54.8	+0.5489	0.5945	+0.1095	+59	- 7
ρ^1 Sagittarii	4	4.17	12.7	18 3.9	3 16.0	- 9 19.7	-0.3692	0.5942	0.1130	+ 6	-61
ρ^2 Sagittarii	5½	4.18	12.7	18 31.3	3 19.2	- 9 16.6	+0.0979	0.5942	0.1131	+31	-32
B. A. C. 6658	6	4.17	13.2	18 35.6	5 50.2	- 6 51.5	+0.4593	0.5935	0.1182	+53	-12
e^1 Sagittarii	6	4.09	14.1	16 33.5	10 58.5	- 1 55.1	-0.9510	0.5923	0.1285	-27	-90
e^2 Sagittarii	5	+4.08	+14.3	-16 23.7	11 42.4	- 1 12.8	-1.0209	0.5920	+0.1299	-33	-90
g Sagittarii	5½	4.03	15.4	15 47.9	17 59.5	+ 4 49.8	-0.7638	0.5901	0.1418	-14	-90
B. A. C. 6992	6½	3.95	16.9	15 9.1	2 3 21.4	-10 9.7	-0.0072	0.5869	0.1580	+30	-38
β Capricorni	3	3.95	16.9	15 8.9	3 27.2	-10 4.1	+0.0047	0.5869	0.1581	+30	-37
Yarnall 8844	6½	3.92	17.1	13 46.2	4 45.3	- 8 49.0	-1.1671	0.5865	0.1603	-42	-90
B. A. C. 7063	6	+3.93	+17.7	-15 26.7	7 36.7	- 6 4.0	+0.9718	0.5855	+0.1648	+75	+20
B. A. C. 7087	5	3.90	17.8	14 7.3	8 55.2	- 4 48.5	-0.1347	0.5849	0.1668	+24	-45
B. A. C. 7221	6½	3.82	18.6	12 58.5	15 48.7	+ 1 49.5	-0.0949	0.5824	0.1767	+27	-43
B. A. C. 7242	6	3.79	18.6	12 0.8	16 50.1	+ 2 48.7	-0.8744	0.5820	0.1782	-17	-90
8 Aquarii	6	3.78	19.1	13 30.2	19 40.8	+ 5 33.1	+1.1269	0.5809	0.1820	+77	+31
ν Aquarii	4½	+3.73	+19.3	-11 50.6	23 46.8	+ 9 30.1	+0.2247	0.5792	+0.1871	+46	-25
17 Aquarii	6½	3.64	19.6	9 49.0	3 5 28.6	- 9 0.8	-0.7148	0.5769	0.1935	- 5	-90
19 Aquarii	6	3.64	19.8	10 14.7	6 26.4	- 8 5.0	-0.1001	0.5766	0.1946	+29	-43
ξ Aquarii	4½	3.56	19.8	8 22.6	11 49.3	- 2 53.8	-0.9026	0.5745	0.1999	-16	-90
B. A. C. 7562	6½	3.55	20.4	9 34.4	14 53.8	+ 0 4.0	+0.9095	0.5733	0.2025	+81	+14
c^1 Capricorni	5½	+3.55	+20.4	- 9 37.1	14 56.0	+ 0 6.1	+0.9618	0.5733	+0.2026	+81	+18
c^2 Capricorni	6½	3.54	20.5	9 48.9	15 28.7	+ 0 37.7	+1.2677	0.5731	0.2031	+80	+45
30 Aquarii	5½	3.45	20.4	7 5.2	22 52.3	+ 7 45.4	+0.0671	0.5704	0.2085	+40	-34
B. A. C. 7744	6	3.39	20.2	5 17.8	4 3 1.0	+11 45.3	-0.8511	0.5690	0.2111	-11	-90
44 Aquarii	5½	3.38	20.5	5 58.2	4 55.3	-10 24.4	+0.2251	0.5684	0.2122	+49	-25
51 Aquarii	5½	+3.34	+20.4	- 5 25.7	7 59.9	- 7 26.3	+0.3383	0.5675	+0.2142	+57	-19
κ Aquarii	5	3.27	20.5	4 49.8	14 0.9	- 1 38.1	+1.0342	0.5657	0.2160	+85	+22
3 Piscium	6	3.15	19.3	0 26.5	5 0 10.5	+ 8 10.3	-1.1537	0.5633	0.2181	-32	-90
B. A. C. 8152	6½	3.04	19.1	- 0 21.2	10 23.0	- 5 58.5	+0.9831	0.5616	0.2180	+90	+19
κ Piscium	4½	3.04	18.9	+ 0 36.9	11 54.7	- 4 29.9	+0.3448	0.5614	0.2177	+58	-19
9 Piscium	6½	+3.04	+18.9	+ 0 28.8	12 3.3	- 4 21.7	+0.5121	0.5614	+0.2177	+70	-10
15 Piscium	6½	2.98	18.7	0 40.0	15 44.7	- 0 47.9	+1.1264	0.5610	0.2170	+90	+30
16 Piscium	6	3.00	18.5	1 27.1	16 9.5	- 0 23.9	+0.4263	0.5609	0.2169	+64	-14
λ Piscium	5	2.96	18.5	1 8.2	18 41.7	+ 2 3.0	+1.2942	0.5607	0.2163	+90	+48
19 Piscium	6	2.95	17.8	2 50.2	20 38.4	+ 3 55.7	+0.0011	0.5606	0.2156	+37	-37
22 Piscium	6½	+2.92	+17.3	+ 2 16.8	23 8.2	+ 6 20.3	+1.1005	0.5604	+0.2147	+90	+28
45 Piscium	6	2.78	15.5	7 2.6	6 14 16.1	- 3 2.9	-0.5193	0.5601	0.2063	+ 9	-70
51 Piscium	6½	2.76	15.6	6 18.5	17 16.4	- 0 8.8	+0.8427	0.5603	0.2042	+90	+11
Yarnall 585	6½	2.60	13.3	9 16.9	7 9 20.0	- 8 38.3	+0.9965	0.5619	0.1900	+90	+23
Yarnall 592	6½	2.60	13.3	9 6.3	9 35.3	- 8 23.7	+1.2249	0.5619	0.1897	+90	+43
π Piscium	6	+2.50	+11.4	+11 32.4	22 4.5	+ 3 39.5	+1.0216	0.5640	+0.1752	+90	+27
104 Piscium	6½	2.53	10.5	13 41.4	23 0.1	+ 4 33.1	-1.0172	0.5641	0.1731	-22	-77
19 Arietis	6	2.38	8.6	14 43.7	8 13 50.7	- 5 7.5	+0.3462	0.5671	0.1532	+59	-12
27 Arietis	6	2.35	6.9	17 11.0	21 36.3	+ 2 21.7	-1.0459	0.5686	0.1410	-26	-73
40 Arietis	6½	2.29	5.9	17 47.6	9 5 14.7	+ 9 43.7	-0.6501	0.5701	0.1282	+ 1	-69
π Arietis	6	+2.26	+ 6.1	+16 58.5	5 35.1	+10 3.5	+0.2412	0.5702	+0.1276	+52	-14
ρ^2 Arietis	6	2.23	5.7	17 51.3	8 23.5	-11 14.2	-0.3199	0.5707	0.1226	+19	-45
ρ^3 Arietis	6	2.24	5.5	17 33.2	8 39.0	-10 59.2	+0.0242	0.5707	0.1221	+39	-25
53 Arietis	6	2.19	4.9	17 25.5	13 24.7	- 6 23.8	+0.7192	0.5716	0.1135	+90	+14
54 Arietis	6½	2.19	4.7	18 20.5	13 47.4	- 6 1.9	-0.1914	0.5717	0.1128	+26	-37
δ Arietis	4½	+2.21	+ 4.1	+19 16.8	15 10.8	- 4 41.5	-1.0120	0.5719	+0.1103	-24	-71
13 Tauri	6½	2.08	2.5	19 19.3	10 4 21.6	+ 8 0.9	+0.2329	0.5738	0.0851	+51	-11
B. A. C. 1143	6½	2.10	2.2	20 33.2	5 15.4	+ 8 52.7	-0.9797	0.5739	0.0834	-22	-70
B. A. C. 1242	6½	2.02	1.4	19 52.0	12 23.4	- 8 14.8	+0.2811	0.5746	0.0690	+55	- 7
A^2 Tauri	6	2.02	0.9	20 41.4	14 8.9	- 6 33.1	-0.4626	0.5747	0.0654	+11	-49
ω^1 Tauri	6	+1.97	+ 1.1	+19 17.8	15 50.3	- 4 55.4	+1.1069	0.5748	+0.0619	+90	+46
ω^2 Tauri	5½	+1.96	+ 0.4	+20 17.2	19 17.2	- 1 36.0	+0.2687	0.5748	+0.0548	+54	- 6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
53 Tauri	6	+1.96	+ 0.1	+20 51.3	10 20 12.1	- 0 43.0	-0.2799	0.5748	+0.0529	+21	-36
56 Tauri	6	1.98	- 0.1	21 29.2	20 15.8	- 0 39.5	-0.9404	0.5748	0.0528	-19	-69
B. A. C. 1373	6½	1.95	0.5	21 21.4	23 51.3	+ 2 48.3	-0.6278	0.5748	0.0453	+ 1	-61
ι Tauri	5	1.83	2.1	21 25.2	11 14 53.2	- 6 42.4	-0.2514	0.5738	0.0138	+23	-31
l Tauri	5½	1.80	2.2	20 15.6	16 56.7	- 4 43.4	+1.0007	0.5736	0.0096	+90	+42
105 Tauri	6	+1.83	- 2.5	+21 32.8	16 57.8	- 4 42.3	-0.3622	0.5736	+0.0095	+17	-37
π Tauri	6	1.79	3.0	21 58.4	21 50.9	+ 0 0.3	-0 7949	0.5729	-0.0008	- 9	-68
o Tauri	6	1.77	3.5	21 50.0	12 1 27.9	+ 3 29.5	-0.6637	0.5722	0.0082	- 1	-61
B. A. C. 1733	6½	1.73	3.5	20 23.2	4 6.1	+ 6 2.0	+0.8472	0.5717	0.0138	+90	+31
ζ Tauri	3½	1.73	3.7	21 4.1	5 49.5	+ 7 41.8	+0.0951	0.5712	0.0174	+43	-11
B. A. C. 1835	6½	+1.70	- 4.3	+20 49.5	10 30.2	-11 47.5	+0.2511	0.5700	-0.0268	+53	- 4
B. A. C. 1867	6½	1.67	4.4	20 16.1	12 40.8	- 9 41.5	+0.7816	0.5694	0.0312	+90	+25
χ^1 Orionis	4½	1.67	4.5	20 15.1	13 9.4	- 9 13.9	+0.7847	0.5692	0.0322	+90	+25
χ^3 Orionis	5	1.64	4.8	19 41.4	17 8.5	- 5 23.2	+1.2428	0.5680	0.0402	+90	+63
χ^4 Orionis	5	1.64	4.9	20 8.3	17 20.1	- 5 12.0	+0.7554	0.5679	0.0405	+90	+23
68 Orionis	6	+1.61	- 5.2	+19 48.8	20 55.1	- 1 44.6	+0.9458	0.5667	-0.0476	+90	+34
MERCURY				19 39.8	13 0 11.1	+ 1 24.7	+0.9466	0.5514	0.0550	+90	+34
B. A. C. 2039	6½	1.61	5.8	21 15.0	1 1.7	+ 2 13.5	-0.8058	0.5651	0.0557	-10	-69
15 Geminorum	6	1.60	6.0	20 51.5	3 53.7	+ 4 59.5	-0.5542	0.5641	0.0611	+ 6	-56
16 Geminorum	6	1.59	5.9	20 33.9	3 58.5	+ 5 4.1	-0.2429	0.5641	0.0612	+23	-35
ν Geminorum	4½	+1.59	- 6.0	+20 17.0	4 26.1	+ 5 30.8	+0.0304	0.5639	-0.0621	+39	-19
				NEW	*MOON.*						
A¹ Cancri	6	1.45	10.4	13 6.0	15 19 53.4	- 5 6.3	+0.6166	0.5334	0.1567	+81	+ 2
A² Cancri	6	1.44	10.5	12 32.4	21 46.5	- 3 16.7	+0.9356	0.5325	0.1587	+90	+21
60 Cancri	6	+1.45	-10.8	+12 4.4	16 2 18.6	+ 1 7.2	+0.7181	0.5303	-0.1631	+90	+ 7
α Cancri	4	1.45	10.8	12 18.6	3 35.9	+ 2 22.1	+0.2469	0.5297	0.1643	+52	-19
κ Cancri	5	1.46	11.1	11 8.4	8 20.1	+ 6 57.8	+0.7461	0.5275	0.1686	+90	+ 8
B. A. C. 3122	6½	1.46	11.0	12 2.5	9 22.5	+ 7 58.4	-0.4213	0.5271	0.1695	+14	-58
ω Leonis	6	1.48	11.7	9 34.0	19 1.6	- 6 39.7	+0.6301	0.5229	0.1770	+82	0
k Leonis	6	+1.49	-11.6	+10 13.9	20 50.6	- 4 53.9	-0.4262	0.5222	-0.1783	+14	-60
14 Sextantis	6	1.57	12.7	6 11.0	17 15 15.8	-11 0.6	+0.6577	0.5158	0.1888	+84	0
16 Sextantis	6	1.58	12.7	6 44.7	16 34.0	- 9 44.7	-0.2103	0.5154	0.1894	+26	-48
19 Sextantis	6½	1.58	13.0	5 11.6	18 29.3	- 7 52.7	+1.1418	0.5149	0.1902	+90	+32
Yarnall 4339	6½	1.63	13.2	4 31.7	18 1 49.9	- 0 44.6	+0.4719	0.5131	0.1929	+67	-11
34 Sextantis	6	+1.69	-13.3	+ 4 11.7	10 33.4	+ 7 44.2	-0.8533	0.5113	-0.1953	-10	-86
36 Sextantis	6	1 70	13.6	3 6.3	11 56.1	+ 9 4.6	+0.0871	0.5111	0.1956	+42	-32
B. A. C. 3726	6	1.72	13.9	1 38.8	15 46.9	-11 11.3	+0.9499	0.5106	0.1963	+90	+17
55 Leonis	6	1.73	14.0	1 21.7	17 39.7	- 9 21.5	+0.8976	0.5103	0.1966	+90	+13
p³ Leonis	6	1.77	14.1	0 37.8	21 58.4	- 5 9.9	+0.8610	0.5098	0.1970	+90	+11
p⁵ Leonis	5	+1.81	-14.1	+ 0 34.1	19 3 30.1	+ 0 12.4	-0.1590	0.5094	-0.1970	+29	-46
B. A. C. 3901	6	1.88	14.4	- 1 3.3	11 12.3	+ 7 41.8	+0.1236	0.5092	0.1967	+44	-31
B. A. C. 3903	6½	1.88	14.2	0 15.1	11 17.3	+ 7 46.6	-0.7830	0.5092	0.1967	- 6	-90
B. A. C. 3909	6	1.88	14.3	0 12.2	12 1.4	+ 8 29.5	-0.9819	0.5092	0.1967	-19	-90
e Leonis	4½	1.90	14.9	2 21.4	12 31.3	+ 8 58.6	+1.3086	0.5092	0.1966	+88	+50
B. A. C. 3955	5½	+1.94	-14.6	- 1 47.3	16 55.3	-10 44.8	-0.1871	0.5093	-0.1962	+27	-48
χ Virginis	5	2.29	15.0	7 21.0	21 1 40.6	- 2 54.9	-0.3084	0.5150	0.1852	+19	-56
B. A. C. 4259	6	2.29	15.0	7 23.3	1 45.2	- 2 50.4	-0.2815	0.5151	0.1851	+21	-54
28 Virginis	6	2.30	14.7	6 51.3	3 6.7	- 1 31.2	-1.1197	0.5154	0.1844	-31	-90
B. A. C. 4312	6½	2.39	15.5	9 42.0	8 4.1	+ 3 17.6	+1.1112	0.5171	0.1816	+81	+29
ψ Virginis	5	+2.40	-15.1	- 8 54.1	9 38.2	+ 4 48.9	-0.0532	0.5176	-0.1806	+32	-40
g Virginis	6	2.49	15.0	10 6.8	16 41.8	+11 40.2	+0.0220	0.5203	0.1758	+35	-36
50 Virginis	6	2.50	14.8	9 42.2	17 39.8	-11 23.5	-0.5984	0.5207	0.1751	+ 2	-78
58 Virginis	6	2.55	14.4	9 55.7	21 38.7	- 7 31.6	-1.0421	0.5224	0.1720	-27	-90
α Virginis	1	2.61	14.3	10 32.9	22 1 36.4	- 3 41.0	-1.0351	0.5241	0.1688	-27	-90
i Virginis	5½	+2.64	-14.8	-12 5.9	2 22.7	- 2 56.1	+0.5317	0.5245	-0.1682	+66	- 8
B. A. C. 4531	6	+2.70	-14.5	-12 36.8	6 25.2	+ 0 59.1	+0 4232	0.5265	-0.1646	+58	-14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 4679	6½	+2.93	-14.0	-14 24.4	22 21 15.5	- 8 37.8	+0.0414	0.5343	-0.1498	+34	-36
B. A. C. 4700	5½	2.98	13.7	15 44.9	23 0 22.1	- 5 36.9	+1.0363	0.5361	0.1464	+75	+25
B. A. C. 4896	6	3.29	11.5	17 18.1	19 48.3	-10 48.1	+0.1009	0.5484	0.1212	+32	-32
ι^1 Libræ	4½	3.46	10.5	19 20.8	24 5 18.4	- 1 37.1	+1.2056	0.5546	0.1068	+71	+43
ι^2 Libræ	6	3.47	10.4	19 12.3	5 48.7	- 1 7.8	+0.9998	0.5550	0.1061	+71	+22
26 Libræ	6½	+3.44	- 9.7	-17 19.8	6 24.5	- 0 33.2	-1.0671	0.5554	-0.1051	-38	-90
28 Libræ	6	3.49	9.3	17 43.9	9 16.6	+ 2 13.1	-0.9309	0.5573	0.1004	-28	-90
B. A. C. 5109	6½	3.60	8.9	19 16.2	14 31.1	+ 7 16.8	+0.2044	0.5607	0.0916	+36	-26
41 Libræ	6	3.62	8.2	18 54.8	17 19.6	+ 9 59.5	-0.4231	0.5625	0.0867	+ 1	-65
κ Libræ	5	3.65	8.1	19 17.8	18 40.4	+11 17.5	-0.1314	0.5634	0.0844	+16	-45
λ Libræ	6	+3.73	- 7.2	-19 48.9	23 40.7	- 7 52.7	+0.0176	0.5665	-0.0753	+23	-36
B. A. C. 5281	6	3.79	7.0	20 38.5	25 1 33.5	- 6 3.8	+0.7521	0.5677	0.0718	+70	+ 6
β^1 Scorpii	2	3.80	6.0	19 29.0	4 57.3	- 2 47.2	-0.7028	0.5699	0.0653	-18	-90
β^2 Scorpii	5½	3.80	6.0	19 28.8	4 57.4	- 2 47.1	-0.7060	0.5699	0.0653	-18	-90
B. A. C. 5333	6½	3.80	6.0	19 21.6	5 5.5	- 2 39.4	-0.8418	0.5700	0.0652	-26	-90
ω^1 Scorpii	4½	+3.83	- 6.2	-20 21.0	5 31.9	- 2 13.9	+0.1732	0.5703	-0.0642	+31	-27
ω^2 Scorpii	5	3.84	6.2	20 33.0	5 47.0	- 1 59.4	+0.3683	0.5704	0.0636	+43	-16
ν^1 Scorpii	6	3.83	5.3	19 8.7	7 47.2	- 0 3.5	-1.2348	0.5717	0.0598	-60	-90
ν^2 Scorpii	4	3.83	5.3	19 9.3	7 47.6	- 0 3.1	-1.2246	0.5717	0.0598	-59	-90
B. A. C. 5395	6	3.90	5.7	21 5.9	8 29.0	+ 0 36.8	+0.7798	0.5721	0.0584	+69	+ 8
ψ Ophiuchi	5	+3.91	- 4.4	-19 45.7	12 58.0	+ 4 56.1	-0.8664	0.5749	-0.0495	-29	-90
ω Ophiuchi	5	3.99	4.1	21 12.8	16 20.9	+ 8 11.6	+0.4995	0.5769	0.0425	+50	- 9
B. A. C. 5567	6	4.01	2.9	20 10.7	19 55.6	+11 38.4	-0.7204	0.5789	0.0369	-21	-90
B. A. C. 5580	6½	3.99	2.7	19 41.9	20 29.4	-11 49.0	-1.2405	0.5792	0.0338	-63	-90
B. A. C. 5663	6½	4.07	1.7	20 13.0	26 1 18.2	- 7 10.9	-0.8358	0.5819	0.0235	-30	-90
Lalande 30971	6½	+4.11	- 0.6	-20 13.1	5 35.9	- 3 2.9	-0.9122	0.5841	-0.0142	-35	-90
B. A. C. 5758	6	4.16	- 0.6	21 24.0	6 34.7	- 2 6.3	+0.2996	0.5846	0.0121	+34	-20
Yarnall 7137	6½	4.17	+ 0.3	20 49.8	10 10.2	+ 1 21.1	-0.3185	0.5863	-0.0041	- 2	-57
ξ Ophiuchi	5	4.21	1.0	20 59.0	12 39.7	+ 3 44.9	-0.1628	0.5873	+0.0016	+ 6	-47
B. A. C. 5866	6	4.23	1.4	21 19.8	14 10.6	+ 5 12.4	+0.1974	0.5879	0.0039	+28	-26
B. A. C. 5954	6	+4.30	+ 2.8	-21 50.4	19 53.6	+10 42.3	+0.7874	0.5901	+0.0044	+68	+ 9
58 Ophiuchi	5	4.31	3.2	21 37.4	21 48.0	-11 27.7	+0.6020	0.5907	0.0223	+56	- 3
B. A. C. 5992	6½	4.32	3.2	22 8.4	22 10.4	-11 6.2	+1.1397	0.5909	0.0356	+68	+38
B. A. C. 6081	6	4.32	5.2	20 19.6	27 4 30.8	- 5 0.4	-0.5229	0.5927	0.0378	-10	-73
B. A. C. 6098	6	4.35	5.4	20 44.1	5 33.6	- 4 0.0	-0.0663	0.5930	0.0402	+15	-41
Yarnall 7631	6½	+4.38	+ 5.7	-21 27.2	7 22.8	- 2 15.0	+0.7435	0.5934	+0.0443	+69	+ 6
μ Sagittarii	4	4.39	6.4	21 5.2	10 1.7	+ 0 17.7	+0.4942	0.5941	0.0507	+50	- 9
14 Sagittarii	6	4.41	6.3	21 44.5	10 13.0	+ 0 28.5	+1.1708	0.5941	0.0509	+69	+41
15 Sagittarii	5	4.39	6.6	20 45.6	10 37.0	+ 0 51.7	+0.1925	0.5942	0.0518	+31	-26
16 Sagittarii	6	4.38	6.6	20 25.2	10 37.5	+ 0 52.1	-0.1530	0.5942	0.0518	+11	-46
21 Sagittarii	5	+4.41	+ 7.7	-20 36.1	14 40.8	+ 4 46.0	+0.2599	0.5949	+0.0601	+35	-22
B. A. C. 6292	6	4.37	8.5	18 58.8	17 6.3	+ 7 5.8	-1.2283	0.5953	0.0667	-60	-90
B. A. C. 6347	6½	4.45	9.1	21 8.9	20 5.2	+ 9 57.7	+1.1771	0.5956	0.0736	+69	+41
Yarnall 7918	6	4.41	9.7	19 23.6	21 43.5	+11 32.2	-0.4760	0.5958	0.0755	- 4	-69
Yarnall 7942	6	4.42	9.9	19 43.5	22 57.4	-11 16.8	-0.0432	0.5959	0.0800	+20	-40
Yarnall 7955	6	+4.44	+10.0	-20 23.9	23 40.9	-10 35.0	+0.6950	0.5960	+0.0815	+68	+ 3
29 Sagittarii	6	4.44	10.2	20 27.3	28 0 23.9	- 9 53.7	+0.8108	0.5960	0.0831	+70	+10
Yarnall 8035	6½	4.42	11.2	19 18.2	3 35.0	- 6 50.1	-0.0742	0.5961	0.0902	+19	-42
Yarnall 8087	6½	4.48	11.7	19 23.5	5 45.8	- 4 44.4	+0.2163	0.5962	0.0951	+36	-25
Yarnall 8088	6	4.42	11.7	19 16.1	5 47.2	- 4 43.1	+0.0947	0.5962	0.0952	+29	-32
Yarnall 8122	6½	+4.42	+12.1	-18 54.9	7 24.0	- 3 10.0	-0.1047	0.5962	+0.0987	+18	-43
B. A. C. 6536	6	4.43	12.1	19 28.2	7 50.6	- 2 44.5	+0.4982	0.5962	0.0998	+55	- 9
d Sagittarii	5	4.43	13.2	19 9.5	11 35.1	+ 0 51.2	+0.5711	0.5961	0.1076	+61	- 5
ρ^1 Sagittarii	4	4.41	13.6	18 3.9	13 13.2	+ 2 25.5	-0.3469	0.5960	0.1111	+ 7	-59
ρ^2 Sagittarii	5½	4.42	13.6	18 31.3	13 16.5	+ 2 28.7	+0.1180	0.5960	0.1112	+32	-31
B. A. C. 6658	6	+4.42	+14.2	-18 35.5	15 46.3	+ 4 52.6	+0.4725	0.5958	+0.1165	+55	-11
e^1 Sagittarii	6	+4.37	+15.6	-16 33.5	20 51.7	+ 9 46.2	-0.9415	0.5953	+0.1268	-27	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
JULY.											
e^2 Sagittarii	5	+4.36	+15.7	−16 23.7	28 21 35.1	+10 27.9	−1.0195	0.5952	+0.1284	−32	−90
g Sagittarii	5½	4.35	17.0	15 47.9	29 3 47.7	− 7 34 0	−0.7696	0.5944	0.1288	−14	−90
B. A. C. 6992	6½	4.32	18.8	15 9.1	13 0.9	+ 1 17.8	−0.0383	0.5925	0.1572	+28	−39
β Capricorni	3	4.32	18.8	15 8.9	13 6 6	+ 1 23.2	−0.0265	0.5925	0.1573	+28	−39
Yarnall 8844	6½	4.29	19 1	13 46.1	14 23.4	+ 2 37.1	−1.1918	0.5922	0.1596	−44	−90
B. A. C. 7063	6	+4.32	+19.5	−15 26.6	17 11.7	+ 5 19.0	+0.9232	0.5915	+0.1642	+75	+16
B. A. C. 7087	5	4.29	19.8	14 7.2	18 28.6	+ 6 32.9	−0.1765	0.5911	0.1663	+21	−47
B. A. C. 7221	6½	4.25	20.8	12 58.5	30 1 13.7	−10 57.5	−0.1520	0.5892	0.1767	+24	−46
B. A. C. 7242	6	4.22	21.0	12 0.8	2 13.6	− 9 59.8	−0 9255	0.5889	0.1782	−20	−90
8 Aquarii	6	4.24	21.6	13 30.2	5 0.5	− 7 19.2	+1.0483	0.5881	0.1820	+77	+25
ν Aquarii	4½	+4.19	+22.0	−11 50.5	9 0 6	− 3 28.2	+0.1468	0.5869	+0.1874	+41	−29
17 Aquarii	6½	4.14	22.6	9 48.9	14 33.8	+ 1 52.4	−0.7937	0.5852	0.1941	−10	−90
19 Aquarii	6	4.14	22.8	10 14.6	15 30.1	+ 2 46.7	−0.1883	0.5849	0.1951	+24	−48
ξ Aquarii	4½	4.10	23.3	8 22.6	20 44.3	+ 7 49.1	−0.9924	0.5832	0.2007	−22	−90
B. A. C. 7562	6½	4.09	23.7	9 34.3	23 43.6	+10 41.7	+0.7905	0.5823	0.2036	+61	+ 7
c^1 Capricorni	5½	+4.09	+23.7	− 9 37.0	23 45.7	+10 43.7	+0.8422	0.5823	+0.2036	+81	+10
c^2 Capricorni	6½	4.08	23.8	9 48.8	31 0 17.4	+11 14.3	+1.1424	0.5822	0.2041	+81	+32
30 Aquarii	5½	4.01	24.0	7 5.1	7 28.0	− 5 51.0	−0.0575	0.5800	0.2101	[illegible]	−40
B. A. C. 7744	6	3.96	24.0	5 17.7	11 29.2	− 1 58.8	−0.9714	0.5789	0.2128	−19	−90
44 Aquarii	5½	3.96	24.3	5 58.2	13 20.0	− 0 12.0	+0.0868	0.5784	0.2140	+41	−32
51 Aquarii	5½	+3.93	+24.4	− 5 25.6	16 18.7	+ 2 40.2	+0.1922	0.5775	+0.2156	+48	−27
κ Aquarii	5	+3.90	+24.6	− 4 49.8	22 8 3	+ 8 17.1	+0.8670	0.5759	+0.2181	+85	+11
AUGUST.											
3 Piscium	6	+3.82	+24.0	− 0 26.4	1 7 58.2	− 6 14.2	−1.3068	0.5736	+0.2204	−50	−90
B. A. C. 8152	6½	3.74	24.0	− 0 21.1	17 50.8	+ 3 17.2	+0.7839	0.5718	0.2204	+90	+ 6
κ Piscium	4½	3.74	23.7	+ 0 37.0	19 19.5	+ 4 42.6	+0.1518	0.5716	0.2204	+46	−29
9 Piscium	6½	3.74	23.8	0 28.9	19 27.8	+ 4 50.5	+0.3161	0.5716	0 2204	+56	−20
15 Piscium	6½	3.70	23.6	0 40.1	23 2.2	+ 8 17.3	+0.9175	0.5711	0.2195	+90	+14
16 Piscium	6	+3.71	+23.5	+ 1 27.2	23 26.2	+ 8 40.5	+0.2264	0.5710	+0.2194	+50	−25
λ Piscium	5	3.68	23.4	1 8.2	2 1 53.6	+11 2.6	+1.0782	0.5707	0.2187	+90	+26
19 Piscium	6	3.68	22.9	2 50.3	3 46.7	−11 8.3	−0.1980	0.5704	0.2182	+26	−48
B. A. C. 8276	6½	3.66	23.2	1 34.0	4 49.6	−10 7.7	+1.2927	0.5702	0.2177	+90	+48
22 Piscium	6½	3.65	23.0	2 16 9	6 11.7	− 8 48.5	+0.8820	0.5701	0.2172	+90	+12
45 Piscium	6	+3.56	+20.9	+ 7 2.7	20 52.7	+ 5 21.2	−0.7304	0.5690	+0.2088	− 3	−82
51 Piscium	6½	3.53	20.8	6 18.6	23 47.9	+ 8 10.2	+0.6106	0.5689	0.2066	+79	− 3
Yarnall 585	6½	3.42	18.6	9 17.0	3 15 27.1	− 0 43.9	+0.7539	0.5689	0.1917	+90	+ 7
Yarnall 592	6½	3.41	18.6	9 6.4	15 41.8	− 0 29.7	+0.9797	0.5689	0.1915	+90	+22
π Piscium	6	3.33	16.4	11 32.5	4 3 55.3	+11 17.7	−0.7769	0.5696	0.1767	+90	+10
104 Piscium	6½	+3.36	+15.6	+13 41.5	4 49.8	−11 49.8	−1.2419	0.5696	+0.1755	−44	−77
Yarnall 931	6½	3.24	14.6	12 54.7	14 56.2	− 2 5.0	+1.2537	0.5704	0.1611	+90	+51
19 Arietis	6	3.23	13.2	14 43.8	19 25.9	+ 2 15.0	+0.1084	0.5707	0.1542	+43	−24
27 Arietis	6	3.20	11.1	17 11.1	5 3 5.9	+ 9 38.6	−1.2712	0 5714	0.1419	−52	−73
40 Arietis	6½	3.13	9.8	17 47.6	10 40.0	− 7 3.7	−0.8766	0.5720	0.1291	−14	−72
π Arietis	6	+3.12	+10.0	+16 58.6	11 0.3	− 6 44.1	+0.0097	0.5721	+0.1285	+38	−27
ρ^2 Arietis	6	3.09	9.5	17 51.3	13 47.4	− 4 3.0	−0.5478	0.5723	0.1235	+ 6	−61
ρ^3 Arietis	6	3.10	9.3	17 33.3	14 2.8	− 3 48.1	−0.2046	0.5723	0.1231	+26	−38
53 Arietis	6	3.05	8.7	17 25.6	18 46.8	+ 0 45.6	+0.4900	0.5727	0.1144	+70	0
54 Arietis	6½	3 06	7.8	18 20.6	19 9.5	+ 1 7.5	−0.4163	0.5727	0.1136	+14	−51
δ Arietis	4½	+3.06	+ 7.8	+19 16.9	20 32.5	+ 2 27.5	−1.2323	0.5728	+0.1111	−47	−71
13 Tauri	6½	2.93	5.7	19 19.4	6 9 41.4	− 8 52.1	+0.0168	0.5731	0.0858	+38	−22
B. A. C. 1143	6½	2.96	5.2	20 33.2	10 35.2	− 8 0.3	−1.1921	0.5731	0.0843	−43	−70
B. A. C. 1242	6½	2.85	4.2	19 52 1	17 43.7	− 1 7.1	+0.0727	0.5729	0.0698	+41	−18
A^2 Tauri	6	2.86	3.6	20 41.4	19 29.5	+ 0 34.8	−0.6686	0.5729	0.0662	− 1	−65
ω^1 Tauri	6	+2.81	+ 3.8	+19 17.8	21 11.2	+ 2 12.9	+0.9008	0.5728	+0.0629	+90	+30
ω^2 Tauri	5½	+2.79	+ 2.9	+20 17.3	7 0 38.8	+ 5 33.0	+0.0674	0.5727	+0.0557	+41	−16

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Γ	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
53 Tauri	6	+2.79	+ 2.5	+20 51.4	7 1 33.9	+ 6 26.1	-0.4797	0.5727	+0.0539	+10	-49
56 Tauri	6	2.80	2.3	21 29.3	1 37.7	+ 6 29.7	-1.1402	0.5727	0.0538	-37	-69
B. A. C. 1373	6½	2.76	+ 1.7	21 21.5	5 14.1	+ 9 58.3	-0.8230	0.5724	0.0464	-11	-69
ι Tauri	5	2.58	- 0.6	21 25.2	20 22.1	+ 0 33.8	-0.4296	0.5705	0.0166	+13	-42
l Tauri	5½	2.54	0.6	20 15.7	22 26.8	+ 2 34.0	+0.8269	0.5702	0.0108	+90	+30
105 Tauri	6	+2.56	- 1.0	+21 32.8	22 28.0	+ 2 35.2	-0.5376	0.5702	+0.0108	+ 6	-50
κ Tauri	6	2.52	1.8	21 58.4	8 3 23.6	+ 7 20.4	-0.9645	0.5692	+0.0007	-21	-68
o Tauri	6	2.48	2.3	21 50.0	7 2.8	+10 51.8	-0.8283	0.5683	-0.0068	-12	-68
B. A. C. 1733	6½	2.42	2.3	20 23.2	9 42.5	-10 34.2	+0.6900	0.5676	0.0122	+90	+22
ζ Tauri	3½	2.42	2.7	21 4.1	11 27.0	- 8 53.3	-0.0614	0.5672	0.0157	+34	-20
B. A. C. 1835	6½	+2.38	- 3.3	+20 49.5	16 10.7	- 4 19.6	+0.1022	0.5660	-0.0251	+43	-12
B. A. C. 1867	6½	2.35	3.5	20 16.2	18 22.6	- 2 12.2	+0.6379	0.5653	0.0294	+86	+17
χ^1 Orionis	4½	2.34	3.5	20 15.1	18 51.6	- 1 44.3	+0.6415	0.5652	0.0304	+87	+17
χ^2 Orionis	6	2.33	3.4	19 43.5	19 6.6	- 1 29.8	+1.1989	0.5651	0.0309	+90	+58
χ^3 Orionis	5	2.29	3.9	19 41.4	22 53.3	+ 2 9.0	+1.1079	0.5640	0.0382	+90	+48
χ^4 Orionis	5	+2.29	- 4.0	+20 8.3	23 5.1	+ 2 20.4	+0.6188	0.5639	-0.0385	+84	+15
68 Orionis	6	2.25	4.4	19 48.8	9 2 42.5	+ 5 50.2	+0.8162	0.5627	0.0456	+90	+26
B. A. C. 2039	6½	2.23	5.4	21 15.0	6 51.9	+ 9 51.1	-0.9342	0.5612	0.0534	-19	-69
15 Geminorum	6	2.21	5.6	20 51.5	9 45.9	-11 21.0	-0.6769	0.5602	0.0588	- 2	-66
16 Geminorum	6	2.20	5.6	20 33.9	9 50.8	-11 16.2	-0.3643	0.5601	0.0590	+17	-42
ν Geminorum	4½	+2.19	- 5.6	+20 17.0	10 18.7	-10 49.3	-0.0892	0.5600	-0.0598	+32	-26
B. A. C. 2432	6½	1.96	8.0	18 29.8	10 11 16.9	-10 41.2	-0.1970	0.5496	0.1026	+26	-36
Lalande 14620	6	1.91	8.2	17 19.5	15 25.2	- 6 40.9	+0.6397	0.5480	0.1090	+85	+ 9
f Geminorum	6	1.89	8.5	17 56.4	19 3.1	- 3 10.1	-0.4358	0.5463	0.1145	+12	-53
1 Cancri	6	1.83	8.9	16 6.1	11 3 [illegible]0.0	+ 5 0.5	+0.5521	0.5425	0.1264	+75	+ 2
5 Cancri	6	+1.82	- 9.1	+16 46.6	5 40.2	+ 7 6.6	-0.4636	0.5415	-0.1294	+11	-56
				NEW	*MOON.*						
36 Sextantis	6	1.65	12.4	3 6.3	14 18 26.6	- 6 37.4	+0.2386	0.5128	0.1942	+51	-24
B. A. C. 3726	6	1.66	12.6	1 38.9	22 16.8	- 2 53.7	+1.1110	0.5121	0.1949	+90	+29
55 Leonis	6	+1.67	-12.6	+ 1 21.7	15 0 9.6	- 1 4.0	+1.0615	0.5119	-0.1952	+90	+25
p^2 Leonis	6	1.69	12.9	0 37.9	4 27.8	+ 3 7.0	+1.0337	0.5115	0.1957	+90	+23
p^5 Leonis	5	1.71	12.8	+ 0 34.1	9 59.0	+ 8 28.9	+0.0219	0.5112	0.1961	+38	-36
B. A. C. 3901	6	1.75	12.9	- 1 3.3	17 40.6	- 8 2.4	+0.3191	0.5110	0.1957	+56	-20
B. A. C. 3903	6½	1.75	12.8	0 15.1	17 45.5	- 7 57.5	-0.5893	0.5110	0.1957	+ 5	-77
B. A. C. 3909	6	+1.74	-12.7	- 0 12.2	18 29.6	- 7 14.7	-0.7875	0.5110	-0.1956	- 6	-90
B. A. C. 3955	5½	1.78	12.9	1 47.2	23 23.3	- 2 29.2	+0.0176	0.5110	0.1952	+38	-36
χ Virginis	5	2.04	13.0	7 21.0	17 8 11.7	+ 5 23.8	-0.0588	0.5151	0.1840	+32	-40
B. A. C. 4259	6	2.04	13.0	7 23.2	8 16.4	+ 5 28.4	-0.0317	0.5151	0.1840	+33	-39
28 Virginis	6	2.05	12.8	6 51.3	9 38.3	+ 6 47.9	-0.8720	0.5155	0.1832	-14	-90
ψ Virginis	5	+2.12	-12.9	- 8 54.1	16 11.9	-10 49.8	+0.2057	0.5172	-0.1794	+47	-26
g Virginis	6	2.20	12.8	10 6.8	23 18.5	- 3 55.5	+0.2874	0.5193	0.1746	+51	-21
50 Virginis	6	2.20	12.7	9 42.2	18 0 17.0	- 2 58.7	-0.3352	0.5196	0.1738	+17	-57
58 Virginis	6	2.25	12.4	9 55.6	4 18.0	+ 0 55.2	-0.7789	0.5210	0.1708	- 9	-90
α Virginis	1	2.29	12.2	10 32.9	8 18.0	+ 4 48.2	-0.7691	0.5224	0.1699	- 9	-90
i Virginis	5½	+2.32	-12.7	-12 5.8	9 4.9	+ 5 33.7	+0.8078	0.5227	-0.1669	+78	+ 8
B. A. C. 4531	6	2.37	12.4	12 36.8	13 9.9	+ 9 31.4	+0.7009	0.5243	0.1633	+78	+ 2
86 Virginis	6	2.42	11.7	11 50.3	18 54.8	- 8 53.9	-1.0745	0.5267	0.1580	-32	-90
B. A. C. 4679	6½	2.58	12.0	14 24.4	19 4 12.5	+ 0 6.8	+0.3230	0.5310	0.1484	+49	-19
B. A. C. 4896	6	2.90	9.9	17 18.1	20 3 10.6	- 1 38.3	+0.3841	0.5430	0.1198	+50	-16
ι^2 Libræ	6	+3.09	- 9.1	-19 12.3	13 24.7	+ 8 15.8	+1.2706	0.5485	-0.1050	+71	+55
26 Libræ	6½	3.05	9.1	17 19.8	14 1.4	+ 8 51.4	-0.8007	0.5489	0.1040	-19	-90
28 Libræ	6	3.10	8.1	17 43.9	16 57.7	+11 41.9	-0.6645	0.5505	0.0995	-11	-89
B. A. C. 5109	6½	3.21	7.7	19 16.1	22 20.2	- 7 6.3	+0.4804	0.5536	0.0908	+53	-10
41 Libræ	6	3.24	7.2	18 54.8	21 1 13.1	- 4 19.3	-0.1563	0.5552	0.0858	+15	-46
κ Libræ	5	+3.27	- 7.1	-19 17.8	2 36.1	- 2 59.0	+0.1377	0.5560	-0.0846	+31	-29
λ Libræ	6	+3.35	- 6.3	-19 48.9	7 44.5	+ 1 58.9	+0.2853	0.5589	-0.0746	+39	-21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 5281	6	+3.40	- 6.2	-20 38.5	21 9 40.4	+ 3 50.8	+1.0271	0.5600	-0.0712	+70	+25
β^1 Scorpii	2	3.42	5.1	19 29.0	13 9.9	+ 7 13.1	-0.4481	0.5620	0.0650	- 3	-67
β^2 Scorpii	5½	3.42	5.1	19 28.8	13 10.0	+ 7 13 2	-0.4515	0.5620	0.0650	- 3	-67
B. A. C. 5333	6½	3.42	5.0	19 21.6	13 18.3	+ 7 21.2	-0.5888	0.5620	0.0647	-11	-80
ω^1 Scorpii	4½	3.45	5.3	20 21.0	13 45 5	+ 7 47.4	+0.4379	0.5623	0.0639	+48	-12
ω^2 Scorpii	5	+3.46	- 5.2	-20 33.0	14 0.9	+ 8 2.3	+0.6353	0.5625	-0.0634	+63	- 1
ν^1 Scorpii	6	3.46	4.4	19 8.6	16 4.6	+10 1.7	-0.9891	0.5636	0.0596	-37	-90
ν^2 Scorpii	4	3.46	4.4	19 9.2	16 5.0	+10 2.1	-0.9788	0.5636	0.0595	-36	-90
B. A. C. 5395	6	3.52	4.9	21 5.9	16 47.6	+10 43.2	+1.0491	0.5640	0.0582	+69	+28
ψ Ophiuchi	5	3.54	3.5	19 45.7	21 24.3	- 8 49.8	-0.6210	0.5664	0.0495	-14	-84
ω Ophiuchi	5	+3.62	- 3.4	-21 12.8	22 0 53.1	- 5 28.3	+0.7582	0.5683	-0.0426	+69	+ 7
B A. C. 5567	6	3.65	2.0	20 10.7	4 34.0	- 1 55.3	-0.4805	0.5701	0.0362	- 8	-70
B. A. C. 5580	6½	3.64	1.9	19 41.9	5 8.9	- 1 21.6	-1.0079	0.5705	0.0342	-40	-90
B. A. C. 5663	6½	3.73	1.0	20 13.0	10 6.2	+ 3 25.0	-0.6016	0.5730	0.0243	-15	-82
Lalande 30971	6½	3.78	0.0	20 13.1	14 31.5	+ 7 40.7	-0.6861	0.5751	0.0150	-21	-90
B. A. C. 5758	6	+3.82	- 0.2	-21 24.0	15 32.0	+ 8 39.0	+0.5390	0.4756	-0.0129	+51	- 6
Yarnall 7137	6½	3.86	+ 0.8	20 49.8	19 13.7	-11 47.4	-0.0915	0.5772	-0.0051	+10	-42
ξ Ophiuchi	5	3.90	1.3	20 59.0	21 47.6	- 9 19.2	+0.0627	0.5782	+0.0004	+19	-33
B. A. C. 5866	6	3.93	1.7	21 19.8	23 21.2	- 7 49.0	+0.4257	0.5789	0.0037	+41	-13
B. A. C. 5954	6	4.00	2.9	21 50.4	23 5 13.9	- 2 9.4	+1.0132	0.5812	0.0163	+68	+26
58 Ophiuchi	5	+4.02	+ 3.3	-21 37.4	7 11.5	- 0 16.2	+0.8231	0.5819	+0.0207	+69	+11
B. A. C. 6081	6	4.05	5.4	20 19.6	14 5.4	+ 6 22.3	-0.3255	0.5843	0.0356	+ 1	-58
B. A. C. 6098	6	4.08	5.5	20 44.1	15 9.8	+ 7 24.2	+0.1342	0.5846	0.0381	+26	-29
Yarnall 7631	6½	4.12	5.7	21 27.2	17 2.0	+ 9 12.1	+0.9497	0.5852	0.0422	+69	+20
μ Sagittarii	4	4.14	6.5	21 5.2	19 45.0	+11 49.0	+0.6934	0.5859	0.0482	+67	+ 3
15 Sagittarii	5	+4.14	+ 6.6	-20 45.6	20 21.2	-11 36.1	+0.3869	0.5861	+0.0495	+42	-15
16 Sagittarii	6	4.13	6.7	20 25.2	20 21.7	-11 35.7	+0.0380	0.5861	0.0495	+22	-35
21 Sagittarii	5	4.17	7.7	20 36.1	24 0 31.1	- 7 35.7	+0.4477	0.5871	0.0586	+48	-12
B. A. C. 6287	6	4.14	8.7	18 48.0	2 32.2	- 5 39.1	-1.2741	0.5876	0.0630	-67	-90
B. A. C. 6292	6	4.14	8.8	18 58.8	3 0.2	- 5 12.3	-1.0597	0.5877	0.0641	-42	-90
Yarnall 7918	6	+4.21	+ 9.8	-19 23.6	7 43.9	- 0 39.3	-0.3085	0.5886	+0.0744	+ 5	-56
Yarnall 7941	6½	4.19	10.4	18 28.9	8 57.7	+ 0 31.6	-1.1434	0.5888	0.0771	-48	-90
Yarnall 7942	6	4.23	10.0	19 43.5	8 59.4	+ 0 33.3	+0.1257	0.5888	0.0772	+29	-30
Yarnall 7955	6	4.25	10.0	20 23.9	9 43.9	+ 1 16.1	+0.8694	0.5889	0.0789	+70	+14
29 Sagittarii	6	4.26	10.2	20 27.3	10 27.8	+ 1 58.4	+0.9849	0.5891	0.0804	+70	+23
Yarnall 8035	6½	+4.26	+11.2	-19 18.2	13 43.0	+ 5 6.1	+0.0852	0.5895	+0.0873	+28	-32
Yarnall 8087	6½	4.27	11.1	19 23.5	15 56.5	+ 7 14.5	+0.3739	0.5898	0.0920	+46	-16
Yarnall 8088	6	4.26	11.7	19 16.1	15 57.9	+ 7 15.8	+0.2511	0.5898	0.0921	+38	-23
Yarnall 8122	6½	4.27	12.1	18 54.9	17 36.6	+ 8 50.7	+0.0464	0.5900	0.0956	+26	-34
B. A. C. 6536	6	4.28	12.1	19 28.2	18 3.8	+ 9 16.9	+0.6531	0.5900	0.0965	+67	0
d Sagittarii	5	+4.28	+13.0	-19 9.5	21 52.5	-11 3.2	+0.7185	0.5904	+0.1046	+71	+ 4
ρ^1 Sagittarii	4	4 27	13.7	18 3.9	23 32.3	- 9 27 2	-0.2098	0.5904	0.1060	+14	-50
ρ^2 Sagittarii	5½	4.28	13.6	18 31.3	23 35.6	- 9 24.0	+0.2583	0.5904	0.1082	+40	-22
B. A. C. 6658	6	4.30	14.1	18 35.5	25 2 8.0	- 6 57.5	+0.6094	0.5904	0.1132	+64	- 3
e^1 Sagittarii	6	4.26	15.6	16 33.5	7 18.1	- 1 59.3	-0.8243	0.5906	0.1237	-19	-90
e^2 Sagittarii	5	+4.27	+15.8	-16 23.7	8 2.1	- 1 16.9	-0.8974	0.5906	+0.1251	-24	-90
g Sagittarii	5½	4.31	17.3	15 47.9	14 19.4	+ 4 45.9	-0.6668	0.5905	0.1371	- 8	-88
B. A. C. 6992	6½	4.34	19.4	15 9.0	23 37.8	-10 17.1	+0.0450	0.5899	0.1540	+32	-34
3 Capricorni	3	4.34	19.4	15 8.8	23 43.5	-10 11.7	+0.0564	0.5899	0.1542	+33	-34
Yarnall 8844	6½	4 32	19.9	13 46.1	26 1 0.8	- 8 57.3	-1.1146	0.5898	0.1563	-37	-90
B. A. C. 7063	6	+4.36	+20.1	-15 26.6	3 50.0	- 6 14.5	+0.9072	0.5896	+0.1611	+75	+22
B. A. C. 7087	5	4.34	20.6	14 7.2	5 7.4	- 5 0.1	-0.1075	0.5894	0.1643	+25	-43
B. A. C. 7221	6½	4.34	21.9	12 58.5	11 53.6	+ 1 30.6	-0.1003	0.5886	0.1734	+26	-43
B. A. C. 7242	6	4.32	22.3	12 0.8	12 53.6	+ 2 28.4	-0.8766	0.5885	0.1754	-17	-90
8 Aquarii	6	4.35	22.4	13 30.2	15 40.6	+ 5 8.9	+1.0894	0.5882	0.1795	+77	+29
ν Aquarii	4½	+4.33	+23.2	-11 50.5	19 40.3	+ 8 59.7	+0.1777	0.5876	+0.1850	+43	-28
17 Aquarii	6½	+4.30	+24.1	- 9 48.9	27 1 12.2	- 9 41.0	-0.7764	0.5869	+0.1920	- 9	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
AUGUST.											
		s	″	° ′	d h m	h m				°	°
19 Aquarii	6	+4.31	+24.2	−10 14.6	27 2 8.2	− 8 47.0	−0.1750	0.5867	+0.1932	+24	−47
ξ Aquarii	4½	4.28	25.1	8 22.5	7 20.1	− 3 46.9	−0.9899	0.5861	0.1990	−22	−90
B. A. C. 7562	6½	4.29	25.2	9 34.3	10 17.8	− 0 55.9	+0.7773	0.5856	0.2020	+81	+ 6
c^1 Capricorni	5½	4.29	25.2	9 37.0	10 19.9	− 0 53.9	+0.8288	0.5856	0.2021	+81	+ 9
c^2 Capricorni	6½	4.30	25.3	9 48.8	10 51.2	− 0 23.6	+1.1267	0.5855	0.2026	+80	+31
30 Aquarii	5½	+4.27	+26.2	− 7 5.1	17 56.9	+ 6 26.1	−0.0876	0.5844	+0.2089	+30	−42
B. A. C. 7744	6	4.25	26.6	5 17.7	21 54.6	+10 14.8	−1.0067	0.5838	0.2119	−22	−90
44 Aquarii	5½	4.26	26.7	5 58.1	23 43.7	+11 59.9	+0.0394	0.5836	0.2132	+38	−35
51 Aquarii	5½	4.25	26.8	5 25.6	28 2 39.5	− 9 10.8	+0.1359	0.5831	0.2150	+44	−30
κ Aquarii	5	4.24	27.3	4 49.7	8 22.6	− 3 40.5	+0.7887	0.5823	0.2180	+85	+ 6
B. A. C. 8152	6½	+4.18	+27.4	− 0 21.0	29 3 37.6	− 9 8.1	+0.6526	0.5804	+0.2213	+83	− 1
κ Piscium	4½	4.18	27.3	+ 0 37.0	5 3.9	− 7 45.0	+0.0250	0.5803	0.2212	+38	−36
9 Piscium	6½	4.18	27.3	0 28.9	5 11.9	− 7 37.3	+0.1870	0.5803	0.2211	+48	−27
15 Piscium	6½	4.17	27.2	0 40.1	8 40.3	− 4 16.5	+0.7714	0.5801	0.2206	+90	+ 6
16 Piscium	6	4.17	27.1	1 27.3	9 3.7	− 3 54.0	+0.0884	0.5801	0.2205	+42	−32
λ Piscium	5	+4.15	+26.9	+ 1 8.3	11 26.9	− 1 36.1	+0.9234	0.5800	+0.2199	+90	+15
19 Piscium	6	4.16	26.7	2 50.4	13 16.7	+ 0 9.7	−0.3407	0.5799	0.2194	+19	−57
B. A. C. 8276	6½	4.14	26.8	1 34.1	14 17.7	+ 1 8.5	+1.1280	0.5798	0.2190	+90	+31
22 Piscium	6½	4.15	26.6	2 16.9	15 37.4	+ 2 25.2	+0.7192	0.5798	0.2185	+90	+ 3
45 Piscium	6	4.13	25.0	7 2.7	30 5 50.7	− 7 52.9	−0.9018	0.5796	0.2106	−14	−83
51 Piscium	6½	+4.11	+24.9	+ 6 18.6	8 40.2	− 5 9.6	+0.4138	0.5796	+0.2087	+62	−13
δ Piscium	4½	4.09	24.1	6 57.0	15 31.6	+ 1 26.7	+1.1951	0.5796	0.2025	+90	+39
B. A. C. 286	6½	4.05	23.4	8 11.6	21 20.4	+ 7 2.7	+1.1280	0.5799	0.1967	+90	+33
Yarnall 585	6½	4.06	23.0	9 17.1	23 47.9	+ 9 24.7	+0.5266	0.5800	0.1939	+73	− 5
Yarnall 592	6½	4.06	22.9	9 6.5	31 0 2.2	+ 9 38.5	+0.7489	0.5801	0.1936	+90	+ 7
π Piscium	6	+4.02	+20.4	+11 32.6	11 51.0	− 2 58.8	+0.5322	0.5806	+0.1788	+72	− 4
Yarnall 931	6½	+3.99	+18.8	+12 54.7	22 30.4	+ 7 16.9	+0.9893	0.5809	+0.1630	+90	+26
SEPTEMBER.											
19 Arietis	6	+3.98	+17.5	+14 43.9	1 2 51.5	+11 28.3	−0.1427	0.5809	+0.1561	+29	−38
40 Arietis	6½	3.94	13.7	17 47.7	17 38.2	+ 1 42.1	−1.1410	0.5809	0.1303	−35	−73
π Arietis	6	3.94	13.7	16 58.6	17 57.5	+ 2 0.7	−0.2412	0.5809	0.1298	+23	−42
ρ^2 Arietis	6	3.90	13.4	17 51.4	20 40.4	+ 4 37.6	−0.8011	0.5809	0.1248	− 9	−72
ρ^3 Arietis	6	3.91	13.2	17 33.3	20 55.3	+ 4 52.0	−0.4637	0.5809	0.1242	+11	−55
53 Arietis	6	+3.91	+13.2	+17 25.6	2 1 31.4	+ 9 13.9	+0.2183	0.5808	+0.1156	+50	−14
54 Arietis	6½	3.89	12.0	18 20.7	1 53.9	+ 9 39.5	−0.6748	0.5808	0.1149	− 1	−70
13 Tauri	6½	3.77	8.7	19 19.4	16 4.7	− 0 41.3	−0.2480	0.5799	0.0868	+23	−37
B. A. C. 1242	6½	3.69	7.0	19 52.1	23 57.1	+ 6 53.7	−0.1958	0.5797	0.0706	+26	−33
A^2 Tauri	6	3.70	6.3	20 41.5	3 1 40.8	+ 8 33.6	−0.9290	0.5795	0.0670	−19	−70
ω^1 Tauri	6	+3.64	+ 6.5	+19 17.9	3 20.6	+10 9.6	+0.6237	0.5784	+0.0636	+84	+13
ω^2 Tauri	5½	3.63	5.4	20 17.3	6 44.6	−10 33.8	−0.2002	0.5778	0 0565	+25	−32
53 Tauri	6	3.64	5.0	20 51.4	7 38.7	− 9 41.7	−0.7418	0.5777	0.0546	− 6	−69
ι Tauri	5	3.44	0.8	21 25.2	4 2 11.4	+ 8 10.4	−0.6863	0.5735	0.0159	− 3	−64
B. A. C. 1563	6½	3.37	1.3	19 38.5	3 16.8	+ 9 13.5	+1.2017	0.5731	0.0136	+90	+60
l Tauri	5½	+3.38	+ 0.8	+20 15.7	4 14 6	+10 9.2	+0.5618	0.5728	+0.0117	+77	+14
105 Tauri	6	3.42	+ 0.4	21 32.8	4 15.8	+10 10.4	−0.7927	0.5728	0.0116	−11	−69
n Tauri	6	3.37	− 0.7	21 58.4	9 8.7	− 9 7.2	−1.2142	0.5713	+0.0016	−48	−68
B. A. C. 1651	6½	3.29	0.0	19 41.5	9 54.6	− 8 22.9	+1.1987	0.5704	−0.0001	+90	+60
o Tauri	6	3.33	1.2	21 50.1	12 46.0	− 5 37.7	−1.0782	0.5700	0.0061	−32	−68
B. A. C. 1733	6½	+3.26	− 1.0	+20 23.2	15 24.6	− 3 4.7	+0.4344	0.5691	−0.0112	+66	+ 7
ζ Tauri	3½	3.26	1.8	21 4.1	17 8.4	− 1 24.5	−0.3116	0.5685	0.0147	+19	−35
B. A. C. 1835	6½	3.18	2.5	20 49.5	21 50.5	+ 3 7.5	−0.1446	0.5668	0.0240	+29	−26
B. A. C. 1867	6½	3.14	2.6	20 16.2	5 0 1.8	+ 5 14.2	+0.3899	0.5659	0.0283	+62	+ 3
χ^1 Orionis	4½	3.14	2.7	20 15.2	0 30.6	+ 5 42.1	+0.3942	0.5658	0.0293	+62	+ 4
χ^2 Orionis	6	+3.11	− 2.7	+19 43.5	0 45.5	+ 5 56.5	+0.9493	0.5656	−0.0298	+90	+36
χ^3 Orionis	5	+3.07	− 3.3	+19 41.4	4 31.4	+ 9 34.5	+0.8626	0.5641	−0.0371	+90	+30

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
χ^1 Orionis	5	+3.08	− 3.5	+20 8.3	5 4 43.1	+ 9 45.7	+0.3761	0.5640	−0.0375	+61	+ 2
68 Orionis	6	3.03	4.1	19 48.8	8 19.9	−10 45.0	+0.5764	0.5625	0.0444	+79	+12
71 Orionis	5½	2.98	4.1	19 11.6	9 36.8	− 9 30.8	+1.1828	0.5620	0.0468	+90	+55
B. A. C. 2039	6½	3.00	5.3	21 15.0	12 28.9	− 6 44.6	−1.1636	0.5608	0.0522	−40	−69
15 Geminorum	6	2.95	5.7	20 51.5	15 22.7	− 3 56.7	−0.9040	0.5596	0.0575	−17	−69
16 Geminorum	6	+2.94	− 5.6	+20 33.9	15 27.6	− 3 52.0	−0.5921	0.5595	−0.0577	+ 3	−59
ν Geminorum	4½	2.94	5.5	20 17.0	15 55.5	− 3 25.0	−0.3174	0.5594	0.0585	+19	−39
B. A. C. 2432	6½	2.61	8.4	18 29.7	6 16 56.3	− 3 14.5	−0.3919	0.5477	0.1012	+15	−48
Lalande 14620	6	2.55	8.6	17 19.5	21 5.6	+ 0 46.8	+0.4690	0.5460	0.1068	+68	− 1
f Geminorum	6	2.52	9.2	17 56.4	7 0 44.5	+ 4 18.6	−0.6190	0.5442	0.1122	+ 2	−66
1 Cancri	6	+2.40	− 9.6	+16 6.1	9 13.8	−11 28.3	+0.3833	0.5408	−0.1242	+61	− 7
5 Cancri	6	2.39	10.0	16 46.6	11 24.7	− 9 21.6	−0.6287	0.5394	0.1270	+ 2	−68
Yarnall 3294	6½	2.33	9.7	14 41.4	14 39.7	− 6 12.7	+1.2368	0.5376	0.1312	+90	+52
29 Cancri	6	2.29	10.8	14 35.8	8 0 50.5	+ 3 39.2	−0.0592	0.5333	0.1435	+34	−33
B. A. C. 2872	6½	2.21	10 7	13 39.5	3 20.4	+ 6 4.5	+0.5987	0.5323	0.1463	+80	+ 2
A¹ Cancri	6	+2.17	−11.0	+13 6.0	8 11.6	+10 46.9	+0.5041	0.5304	−0.1515	+70	− 4
A² Cancri	6	2.15	11.0	12 32.3	10 5.7	−11 22.5	+0.8320	0 5296	0.1534	+90	+15
60 Cancri	6	2.10	11.2	12 4.4	14 40.5	− 6 56.0	+0.6342	0.5279	0.1579	+83	+ 3
α Cancri	4	2.10	11.4	12 18.6	15 58.4	− 5 40.4	+0.1658	0.5274	0.1591	+46	−23
κ Cancri	5	2.05	11.5	11 8.3	20 45.0	− 1 2.3	+0.6884	0.5257	0.1635	+89	+ 5
B. A. C. 3122	6½	+2.06	−11.8	+12 2.4	21 46.8	− 0 2.4	−0.4793	0.5254	−0.1644	+11	−62
ω Leonis	6	1.98	11.8	9 34.0	9 7 30.7	+ 9 24.3	+0.6197	0.5221	0.1722	+80	0
h Leonis	6	1.97	12.1	10 13 9	9 20.3	+11 10.7	−0.4330	0.5215	0.1736	+13	−60
π Leonis	5	1.89	12.5	8 36.4	10 0 16.9	+ 1 41.5	−1.1153	0.5175	0.1829	−30	−82
14 Sextantis	6	1.86	12.2	6 11.0	3 49.0	+ 5 7.5	+0.7391	0.5167	0.1847	+90	+ 5
16 Sextantis	6	+1.85	−12.3	+ 6 44.7	5 7.3	+ 6 23 6	−0.1261	0.5164	−0.1853	+30	−43
Yarnall 4339	6½	1.82	12.3	+ 4 31.7	14 23.3	− 8 36.2	+0.6002	0.5148	0.1891	+78	− 4
				NEW	*MOON.*						
χ Virginis	5	1.90	11.7	− 7 21.0	13 14 4.6	−10 55.9	+0.0975	0.5176	0.1829	+41	−31
B. A. C. 4259	6	+1.90	−11.7	− 7 23.2	14 9.2	−10 51.4	+0.1252	0.5176	−0.1828	+42	−30
28 Virginis	6	1.90	11.5	6 51.3	15 30.9	− 9 32.1	−0.7140	0.5179	0.1821	− 4	−90
ψ Virginis	5	1.94	11.5	8 54.1	22 3.6	− 3 10.7	+0.3777	0.5195	0.1782	+57	−16
g Virginis	6	2.00	11.3	10 6 7	14 5 9.3	+ 3 42.6	+0.4717	0.5215	0.1775	+63	−11
50 Virginis	6	2.01	11.1	9 42.2	6 7.8	+ 4 39.5	−0.1514	0.5218	0.1727	+26	−46
58 Virginis	6	+2.02	−10.8	− 9 55.6	10 8.5	+ 8 33.1	−0.5892	0.5230	−0.1697	+ 1	−77
α Virginis	1	2.06	10.7	10 32.9	14 8.4	−11 34.0	−0.5736	0.5243	0.1664	+ 2	−76
i Virginis	5½	2.08	10.9	12 5.8	14 55.3	−10 48.5	+1.0088	0.5246	0.1658	+78	+22
B. A. C. 4531	6	2.11	10.7	12 36.7	19 0.4	− 6 50.6	+0.9078	0.5260	0.1623	+78	+15
86 Virginis	6	2.14	10.0	11 50.3	15 0 45.7	− 1 15.6	−0.8652	0.5282	0.1569	−17	−90
α¹ Libræ	6	+2.48	− 7.5	−15 30.5	16 8 48.3	+ 5 47.7	−1.2797	0.5413	−0.1192	−61	−90
α² Libræ	2½	2.49	7.5	15 33.2	8 54.0	+ 5 53.2	−1.2419	0.5414	0.1191	−54	−90
B. A. C. 4896	6	2.52	8.0	17 18.1	9 12.2	+ 6 10.7	+0.6338	0.5416	0.1185	+68	− 2
26 Libræ	6½	2.64	6.6	17 19.7	20 10.4	− 7 12.1	−0.5529	0.5466	0.1028	− 5	−75
28 Libræ	6	2.67	6.3	17 43.9	23 9.1	− 4 19.3	−0.4141	0.5480	0.0980	+ 3	−64
B. A. C. 5109	6½	+2.76	− 6 1	−19 16.1	17 4 36.4	+ 0 57.4	+0.7432	0.5505	−0.0894	+71	+ 6
41 Libræ	6	2.79	5.6	18 54.8	7 32.1	+ 3 47.3	+0.1023	0.5518	0.0848	+29	−31
κ Libræ	5	2.82	5.5	19 17.8	8 56.5	+ 5 8.9	+0.3995	0.5524	0.0825	+47	−14
λ Libræ	6	2.89	4.8	19 48.9	14 10.4	+10 12.4	+0.5501	0.5548	0.0737	+57	− 6
β¹ Scorpii	2	2.95	3.9	19 28.9	19 42.2	− 8 27.0	−0.1898	0.5573	0.0640	+11	−48
β² Scorpii	5½	+2.95	− 3.9	−19 28.8	19 42.3	− 8 26.9	−0.1931	0.5573	−0.0640	+11	−48
B. A. C. 5333	6½	2.94	3.9	19 21.5	19 50.8	− 8 18.7	−0.3319	0.5573	0.0637	+ 3	−57
ω¹ Scorpii	4½	2.97	4.1	20 21.0	20 18.5	− 7 52.0	+0.7058	0.5575	0.0630	+69	+ 4
ω² Scorpii	5	2.98	4.1	20 33 0	20 34.4	− 7 36.6	+0.9053	0.5577	0.0625	+70	+17
ν¹ Scorpii	6	2.97	3.3	19 8.6	22 40.6	− 5 34.7	−0.7359	0.5586	0.0587	−20	−90
ν² Scorpii	4	+2.97	− 3.3	−19 9.2	22 41.0	− 5 34.3	−0.7256	0.5586	−0.0586	−19	−90
ψ Ophiuchi	5	+3.06	− 2.5	−19 45.6	18 4 7.5	− 0 19.0	−0.3642	0.5608	−0.0468	0	−60

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
ω Ophiuchi	5	+3.14	- 2.4	-21 12.8	18 7 41.2	+ 3 7.3	+1.0306	0.5616	-0.0420	+69	+27
B. A. C. 5567	6	3.16	1.3	20 10.7	11 27.5	+ 6 45.7	-0.2226	0.5638	0.0349	+ 6	-50
B. A. C. 5580	6½	3.15	1.1	19 41.9	12 3.3	+ 7 20.3	-0.7566	0.5640	0.0337	-24	-90
B. A. C. 5663	6½	3.24	- 0.3	20 13.0	17 8.4	-11 45.2	-0.3487	0.5660	0.0239	- 2	-59
Lalande 30971	6½	3.29	+ 0.6	20 13.1	21 41.0	- 7 22.2	-0.4337	0.5676	0.0149	- 7	-66
B. A. C. 5758	6	+3.34	+ 0.3	-21 24.0	22 43.2	- 6 22.2	+0.8044	0.5680	-0.0128	+69	+10
Yarnall 7137	6½	3.38	1.2	20 49.8	19 2 31.4	- 2 42.0	+0.1676	0.5693	-0.0052	+25	-27
ξ Ophiuchi	5	3.42	1.7	20 59.0	5 9.8	- 0 9.3	+0.3225	0.5702	0.0000	+34	-18
B. A. C. 5866	6	3.45	1.9	21 19.8	6 46.3	+ 1 23.8	+0.6899	0.5707	+0.0033	+64	+ 3
58 Ophiuchi	5	3.55	3.4	21 37.4	14 51.2	+ 9 11.3	+1.0889	0.5731	0.0199	+69	+33
B. A. C. 6081	6	+3.59	+ 5.5	-20 19.6	21 58.5	- 7 56.8	-0.0806	0.5749	+0.0345	+14	-42
B. A. C. 6098	6	3.62	5.5	20 44.1	23 5.1	- 6 52.7	+0.3855	0.5751	0.0368	+41	-15
Yarnall 7631	6½	3.66	5.6	21 27.2	20 1 1.0	- 5 1.1	+1.2117	0.5755	0.0408	+69	+47
μ Sagittarii	4	3.68	6.3	21 5.2	3 49.5	- 2 18.7	+0.9495	0.5762	0.0466	+69	+21
15 Sagittarii	5	3.68	6.5	20 45.6	4 26.9	- 1 42.6	+0.6382	0.5763	0.0480	+62	0
16 Sagittarii	6	+3.67	+ 6.7	-20 25.2	4 27.5	- 1 42.1	+0.2839	0.5763	+0.0480	+36	-21
Yarnall 7764	6½	3.65	7.8	18 54.6	7 6.6	+ 0 51.2	-1.1566	0.5768	0.0533	-52	-90
21 Sagittarii	5	3.72	7.5	20 36.1	8 45.4	+ 2 26.4	+0.6963	0.5772	0.0568	+68	+ 3
B. A. C. 6287	6	3.69	8.6	18 48.0	10 50.7	+ 4 27.1	-1.0541	0.5775	0.0612	-42	-90
B. A. C. 6292	6	3.70	8.6	18 58.8	11 19.6	+ 4 54.9	-0.8364	0.5776	0.0623	-26	-90
Yarnall 7918	6	+3.77	+ 9.5	-19 23.6	16 13.2	+ 9 37.8	-0.0785	0.5783	+0.0722	+18	-41
Yarnall 7941	6½	3.77	10.1	18 28.9	17 29.6	+10 51.4	-0.9274	0.5784	0.0747	-31	-90
Yarnall 7942	6	3.80	9.6	19 43.5	17 31.3	+10 53.0	+0.3611	0.5784	0.0748	+43	-16
Yarnall 7955	6	3.82	9.5	20 23.9	18 17.4	+11 37.4	+1.1156	0.5785	0.0764	+70	+34
29 Sagittarii	6	3.83	9.7	20 27.3	19 2.8	-11 38.8	+1.2314	0.5786	0.0778	+70	+49
Yarnall 8035	6½	+3.84	+10.9	-19 18.2	22 24.9	- 8 24.2	+0.3147	0.5791	+0.0847	+41	-19
Yarnall 8088	6	3.86	11.4	19 16.1	21 0 44.5	- 6 9.7	+0.4803	0.5793	0.0891	+53	-10
Yarnall 8122	6½	3.87	11.8	18 54.9	2 26.6	- 4 31.5	+0.2706	0.5795	0.0927	+39	-21
B. A. C. 6536	6	3.88	11.7	19 28.2	2 54.7	- 4 4.4	+0.8859	0.5795	0.0937	+71	+15
d Sagittarii	5	3.91	12.7	19 9.5	6 51.4	- 0 16.4	+0.9473	0.5798	0.1014	+71	+20
ρ¹ Sagittarii	4	+3.91	+13.4	-18 3.9	8 34.7	+ 1 23.1	+0.0028	0.5799	+0.1047	+25	-37
ρ² Sagittarii	5½	3.92	13.3	18 31.3	8 38.2	+ 1 26.5	+0.4776	0.5799	0.1048	+54	-10
B. A. C. 6658	6	3.95	13.7	18 35.5	11 15.8	+ 3 58.2	+0.8312	0.5800	0.1100	+72	+11
e¹ Sagittarii	6	3.96	15.5	16 33.5	16 36.5	+ 9 7.1	-0.6321	0.5804	0.1201	- 8	-84
e² Sagittarii	5	3.96	15.7	16 23.7	17 22.0	+ 9 50.9	-0.7071	0.5805	0.1215	-12	-90
g Sagittarii	5½	+3.99	+17.0	-15 47.9	23 51.8	- 7 53.5	-0.4833	0.5806	+0.1316	+ 2	-69
B. A. C. 6992	6½	4.06	19.0	15 9.1	22 9 27.9	+ 1 21.1	+0.2230	0.5806	0.1497	+42	-24
β Capricorni	3	4.06	19.0	15 8.9	9 33.8	+ 1 26.8	+0.2345	0.5806	0.1499	+43	-24
Yarnall 8844	6½	4.04	19.7	13 46.1	10 53.4	+ 2 43.4	-0.9548	0.5806	0.1521	-25	-90
B. A. C. 7063	6	4.10	19.6	15 26.6	13 47.7	+ 5 31.3	+1.0127	0.5806	0.1568	+75	+23
B. A. C. 7087	5	+4.09	+20.3	-14 7.2	15 7.4	+ 6 48.0	+0.0583	0.5806	+0.1589	+34	-33
B. A. C. 7221	6½	4.11	21.8	12 58.5	22 5.0	-10 29.8	+0.0520	0.5805	0.1693	+34	-34
B. A. C. 7242	6	4.13	22.2	12 0.8	23 6.6	- 9 30.5	-0.7353	0.5805	0.1709	- 9	-90
8 Aquarii	6	4.14	22.0	13 30.2	23 1 57.9	- 6 45.5	+1.2482	0.5805	0.1750	+77	+45
ν Aquarii	4½	4.13	23.1	11 50.5	6 3.7	- 2 48.8	+0.3168	0.5804	0.1806	+51	-19
17 Aquarii	6½	+4.15	+24.4	- 9 48.9	11 43.3	+ 1 38.3	-0.6590	0.5803	+0.1877	- 2	-85
19 Aquarii	6	4.16	24.3	10 14.6	12 40.4	+ 3 33.3	-0.0535	0.5803	0.1888	+31	-40
ξ Aquarii	4½	4.17	25.4	8 22.5	17 58.9	+ 8 40.1	-0.8882	0.5802	0.1947	-16	-90
B. A. C. 7563	6½	4.20	25.4	9 34.3	20 59.9	+11 34.4	+0.8882	0.5802	0.1977	+81	+13
c¹ Capricorni	5½	4.20	25.4	9 37.0	21 2.0	+11 36.4	+0.9399	0.5802	0.1978	+81	+17
c² Capricorni	6½	+4.20	+25.4	- 9 48.8	21 34.0	-11 52.7	+1.2397	0.5802	+0.1983	+80	+43
30 Aquarii	5½	4.21	26.6	7 5.1	24 4 46.5	- 4 56.1	-0.0036	0.5802	0.2048	+35	-37
B. A. C. 7744	6	4.21	27.3	5 17.7	8 47.5	- 1 4.0	-0.9383	0.5802	0.2079	-18	-90
44 Aquarii	5½	4.22	27.3	5 58.1	10 37.9	+ 0 42.4	+0.1102	0.5803	0.2093	+42	-31
51 Aquarii	5½	4.24	27.6	5 25.6	13 35.6	+ 3 33.6	+0.1993	0.5803	0.2112	+48	-26
κ Aquarii	5	+4.26	+28.1	- 4 49.7	19 21.8	+ 9 7.0	+0.8401	0.5804	+0.2146	+85	+10
B. A. C. 8152	6½	+4.31	+28.9	- 0 21.0	25 14 39.7	+ 3 42.3	+0.6507	0.5813	+0.2191	+83	- 1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
κ Piscium	4½	+4.32	+28.9	+ 0 37.1	25 16 5.8	+ 5 5.1	+0.0190	0.5818	+0.2190	+38	−36
9 Piscium	6½	4.32	28.9	0 28.9	16 13.9	+ 5 12.9	+0.1809	0.5818	0.2190	+47	−27
15 Piscium	6½	4.34	28.8	0 40.1	19 41.4	+ 8 32.8	+0.7554	0.5822	0.2187	+90	+ 5
16 Piscium	6	4.34	28.7	1 27.3	20 4.7	+ 8 55.2	+0.0725	0.5822	0.2186	+41	−33
λ Piscium	5	4.34	28.7	1 8.3	22 27.1	+11 12.3	+0.8993	0.5825	0.2183	+90	+14
19 Piscium	6	+4.36	+28.8	+ 2 50.4	26 0 16.1	−11 2.6	−0.3667	0.5827	+0.2179	+17	−59
B. A. C. 8276	6½	4.36	28.7	1 34.1	1 16.7	−10 4.2	+1.0950	0.5828	0.2176	+90	+28
22 Piscium	6½	4.36	28.6	2 16.9	2 35.8	− 8 48.1	+0.6841	0.5830	0.2172	+87	+ 1
45 Piscium	6	4.43	27.9	7 2.8	16 39.2	+ 4 43.9	−0.9641	0.5849	0.2100	−18	−83
51 Piscium	6½	4.42	27.7	6 18.7	19 26.1	+ 7 24.5	+0.3363	0.5851	0.2080	+57	−17
62 Piscium	6	+4.43	+27.0	+ 6 39.8	27 2 0.5	−10 15.8	+1.3440	0.5863	+0.2025	+90	+66
δ Piscium	4½	4.44	27.0	6 57.0	2 10.3	−10 6.4	+1.0952	0.5863	0.2023	+90	+30
B. A. C. 286	6½	4.45	26.1	8 11.6	7 52.1	− 4 37.5	+1.0139	0.5871	0.1968	+90	+25
Yarnall 585	6½	4.46	25.8	9 17.1	10 16.5	− 2 18.6	+0.4135	0.5875	0.1942	+62	−12
Yarnall 592	6½	4.46	25.7	9 6.5	10 30.5	− 2 5.0	+0.6328	0.5875	0.1941	+81	+ 1
B. A. C. 454	6	+4.49	+24.2	+10 17.2	19 50.3	+ 6 53.6	+1.1932	0.5889	+0.1900	+90	+42
π Piscium	6	4.50	23.6	11 32.6	22 2.3	+ 9 0.6	+0.3927	0.5893	0.1794	+61	−11
Yarnall 931	6½	4.52	21.7	12 54.8	28 8 24.2	− 5 1.3	+0.8241	0.5907	0.1639	+90	+15
19 Arietis	6	4.55	20.5	14 43.9	12 37.9	− 0 57.3	−0.3005	0.5910	0.1570	+20	−48
29 Arietis	6½	4.52	18.8	14 31.0	20 40.9	+ 6 47.2	+1.1236	0.5915	0.1429	+90	+40
40 Arietis	6½	+4.58	+16.8	+17 47.8	29 2 57.7	−11 10.4	−1.2903	0.5916	+0.1314	−59	−73
π Arietis	6	4.56	16.9	16 58.7	3 16.8	−10 52.0	−0.4299	0.5916	0.1308	+12	−53
ρ^2 Arietis	6	4.55	16.3	17 51.4	5 54.1	− 8 20.8	−0.9759	0.5917	0.1256	−22	−73
ρ^3 Arietis	6	4.56	16.1	17 33.4	6 8.6	− 8 6.8	−0.6438	0.5917	0.1253	0	−69
53 Arietis	6	4.54	15.1	17 25.7	10 36.3	− 3 49.4	+0.0235	0.5916	0.1164	+38	−25
54 Arietis	6½	+4.56	+14.8	+18 20.7	10 57.6	− 3 28.9	−0.8576	0.5916	+0.1157	−13	−72
B. A. C. 1096	6½	4.46	12.4	17 26.8	21 23.9	+ 6 33.4	+1.1474	0.5909	0.0943	+90	+46
13 Tauri	6½	4.49	11.2	19 19.4	30 0 41.4	+ 9 43.3	−0.4558	0.5904	0.0873	+11	−51
B. A. C. 1242	6½	4.46	9.2	19 52.2	8 18.8	− 6 56.8	−0.4087	0.5892	0.0710	+14	−46
A^2 Tauri	6	4.47	8.5	20 41.5	9 59.3	− 5 20.1	−1.1321	0.5889	0.0673	−37	−70
ω^1 Tauri	6	+4.41	+ 8.5	+19 17.9	11 36.0	− 3 47.2	+0.3958	0.5886	+0.0638	+62	0
ω^2 Tauri	5½	4.41	7.4	20 17.3	14 53.8	− 0 36.8	−0.4185	0.5879	0.0567	+13	−46
53 Tauri	6	4.42	7.0	20 51.4	15 46.2	+ 0 13.5	−0.9526	0.5877	0.0548	−21	−69
ε Tauri	3½	+4.32	+ 6.6	+18 55.1	19 34.0	+ 3 52.8	+1.2280	0.5870	+0 0466	+90	+61

OCTOBER.

Name.	Mag.	$\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
ι Tauri	5	+4.26	+ 2.2	+21 25.2	1 9 46.8	− 6 26.3	−0.9091	0.5820	+0.0159	−18	−69
B. A. C. 1563	6½	4.19	2.5	19 38.6	10 51.9	− 5 3.6	+0.9517	0.5815	0.0136	+90	+38
l Tauri	5½	4.20	2.1	20 15.7	11 46.6	− 4 31.0	+0.3210	0.5811	0.0116	+57	+ 1
105 Tauri	6	4.24	1.7	21 32.9	11 47.8	− 4 29.8	−1.0146	0.5811	+0.0115	−26	−69
B. A. C. 1651	6½	4.11	+ 0.9	19 41.5	17 18.1	+ 0 48.3	+0.9475	0.5789	−0.0002	+90	+39
B. A. C. 1733	6½	+4.08	− 0.5	+20 23.2	22 39.5	+ 5 57.9	+0.1922	0.5765	−0.0115	+48	− 5
ζ Tauri	3½	4.08	1.2	21 4.1	2 0 20.9	+ 7 35.5	−0.5442	0.5757	0.0150	+ 6	−51
B. A. C. 1835	6½	4.00	2.2	20 49.5	4 56.4	−11 58.9	−0.3805	0.5735	0.0244	+15	−40
B. A. C. 1867	6½	3.96	2.5	20 16.2	7 4.9	− 9 55.1	+0.1474	0.5724	0.0286	+46	−10
χ^1 Orionis	4½	3.96	2.6	20 15.1	7 33.0	− 9 28.0	+0.1519	0.5721	0.0296	+46	− 9
χ^2 Orionis	6	+3.93	− 2.6	+19 43.5	7 47.6	− 9 13.9	+0.7001	0.5720	−0.0300	+90	+21
χ^3 Orionis	5	3.88	3.3	19 41.4	11 28.7	− 5 40.7	+0.6148	0.5703	0.0363	+83	+15
χ^4 Orionis	5	3.90	3.5	20 8.3	11 40.2	− 5 29.6	+0.1339	0.5701	0.0367	+45	−11
68 Orionis	6	3.84	4.3	19 48.8	15 12.6	− 2 4.8	+0.3320	0.5683	0.0445	+58	− 1
71 Orionis	5½	3.81	4.3	19 11.6	16 28.0	− 0 52.1	+0.9317	0.5677	0.0470	+90	+34
15 Geminorum	6	+3.78	− 6.2	+20 51.5	22 7.4	+ 4 35.6	−1.1316	0.5646	−0.0576	−37	−69
16 Geminorum	6	3.77	6.1	20 33.8	22 12.3	+ 4 40.2	−0.8233	0.5646	0.0577	−12	−70
ν Geminorum	4½	3.76	6.1	20 17.0	22 39.6	+ 5 6.6	−0.5512	0.5643	0.0586	+ 5	−56
B. A. C. 2432	6½	3.39	9.8	18 29.7	3 23 19.3	+ 4 56.1	−0.6174	0.5501	0.1006	+ 2	−65
Lalande 14620	6	+3.31	−10.1	+17 19.5	4 3 26.1	+ 8 54.7	+0.2210	0.5478	−0.1066	+50	−14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					LIMITING PARALLELS.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
f Geminorum	6	+3.28	−10.8	+17 56.3	4 7 3.0	−11 35.4	−0.8387	0.5459	−0.1118	−12	−72
1 Cancri	6	3.14	11.4	16 6.1	15 28.3	− 3 26.3	+0.1631	0.5413	0.1233	+46	−19
5 Cancri	6	3.12	11.9	16 46.6	17 38.4	− 1 20.4	−0.8418	0.5401	0.1261	−12	−73
Yarnall 3294	6½	3.04	11.7	14 41.4	20 52.3	+ 1 47.4	+1.0165	0.5385	0 1302	+90	+31
29 Cancri	6	2.92	12.9	14 35.8	5 7 0.3	+11 36.4	−0.2631	0.5336	0.1422	+22	−45
B. A. C. 2872	6½	+2.87	−12.8	+13 39.4	9 34.7	− 9 54.0	+0.3952	0.5323	−0.1451	+62	− 9
A^1 Cancri	6	2.80	13.1	13 6.0	14 20.2	− 5 17.1	+0.3056	0.5301	0.1500	+55	−14
A^2 Cancri	6	2.78	13.1	12 32.3	16 14.1	− 3 26.7	+0.6349	0.5293	0.1520	+82	+ 4
60 Cancri	6	2.72	13.5	12 4.3	20 48.3	+ 0 59.3	+0.4432	0.5274	0.1563	+65	− 8
α Cancri	4	2.71	13 6	12 18.6	22 6.2	+ 2 14.8	−0.0217	0.5268	0.1575	+36	−33
κ Cancri	5	+2.64	−13.6	+11 8.3	6 2 52.6	+ 6 52.7	+0.5051	0.5249	−0.1618	+70	+ 5
B. A. C. 3122	6½	2.64	14.1	12 2.4	3 54.4	+ 7 52.7	−0.6566	0.5245	0.1627	0	−75
ω Leonis	6	2.53	14.0	9 34.0	13 38.4	− 6 40.5	+0.4520	0.5210	0.1701	+66	− 9
h Leonis	6	2.51	14.3	10 13.9	15 28.0	− 4 52.2	−0.5958	0.5205	0.1717	+ 4	−73
14 Sextantis	6	2.34	14.1	6 10.9	7 9 57.9	−10 56.2	+0.6033	0.5157	0.1826	+78	− 3
16 Sextantis	6	+2.32	−14.2	+ 6 44.7	11 16.3	− 9 40.0	−0.2590	0.5155	−0.1832	+22	−50
19 Sextantis	6½	2.30	14.0	5 11.6	13 11.9	− 7 47.7	+1.1079	0.5151	0.1853	+90	+30
Yarnall 4339	6½	2.25	14.0	4 31.7	20 32.9	− 0 39.2	+0.4827	0.5139	0.1870	+67	−10
34 Sextantis	6	2.19	14.1	4 11.7	8 5 16.2	+ 7 49.4	−0.7909	0.5130	0.1896	− 7	−86
36 Sextantis	6	2.17	13.9	3 6.3	6 38.7	+ 9 9.6	+0.1602	0.5129	0.1900	+46	−27
B. A. C. 3726	6	+2.14	−13 6	+ 1 38.8	10 28.9	−11 6.6	+1.0491	0.5126	−0.1908	+90	+24
55 Leonis	6	2.13	13.7	1 21.7	12 21.7	− 9 17.0	+1.0076	0.5125	0.1911	+90	+21
p^2 Leonis	6	2.12	13.5	0 37.8	16 39.6	− 5 6.3	+0.9972	0.5124	0.1918	+90	+21
p^5 Leonis	5	2.09	13.6	+ 0 34.1	22 10.1	+ 0 14.9	+0.0090	0.5124	0.1922	+37	−36
B. A. C. 3901	6	2.07	13.4	− 1 3.3	9 5 50.4	+ 7 42.3	+0.3379	0.5127	0.1922	+57	−18
B. A. C. 3903	6½	+2.07	−13.5	− 0 15.1	5 55.2	+ 7 46.9	−0.5698	0.5127	−0.1922	+ 6	−74
B. A. C. 3909	6	2.05	13.4	0 12.2	6 39.2	+ 8 29.7	−0.7649	0.5128	0.1922	− 5	−90
B. A. C. 3955	5½	2.05	13.2	1 47.2	11 31.6	−10 46.1	+0.0602	0.5132	0.1921	+40	−34
				NEW	*MOON.*						
α^1 Libræ	6	+2.28	− 6.5	−15 30.5	13 14 25.2	−10 48.0	−1.1612	0.5446	−0.1186	−45	−90
α^2 Libræ	2½	2.28	6.5	15 33.1	14 30.8	−10 42.6	−1.1233	0.5446	0.1184	−41	−90
B. A. C. 4896	6	2.30	6.7	17 18.0	14 48.9	−10 25.2	+0.7427	0.5447	0.1180	+71	+ 6
26 Libræ	6½	2.37	5.4	17 19.7	14 1 44.3	+ 0 9.2	−0.4218	0.5493	0.1021	+ 3	−64
28 Libræ	6	2.40	5.1	17 43.8	4 42.4	+ 3 1.5	−0.2796	0.5505	0.0977	+10	−54
B. A. C. 5109	6½	+2.46	− 4.7	−19 16.1	10 8.9	+ 8 17.2	+0.8845	0.5527	−0.0889	+71	+15
41 Libræ	6	2.48	4.3	18 54.8	13 4.3	+11 6.8	+0.2454	0.5539	0.0841	+38	−23
κ Libræ	5	2.51	4.2	19 17.8	14 28.6	−11 31.7	+0.5446	0.5544	0.0818	+57	− 6
λ Libræ	6	2.56	3.5	19 48.9	19 42.4	− 6 28.3	+0.7003	0.5565	0.0729	+69	+ 3
β^1 Scorpii	2	2.60	2.6	19 28.9	15 1 14.6	− 1 7.3	−0.0366	0.5585	0.0632	+19	−39
β^2 Scorpii	5½	+2.60	− 2.6	−19 28.7	1 14.7	− 1 7.2	−0.0399	0.5585	−0.0632	+19	−39
B. A. C. 5333	6½	2.60	2.6	19 21.5	1 23.1	− 0 59.0	−0.1793	0.5586	0.0630	+12	−47
ω^1 Scorpii	4½	2.62	2.7	20 20 9	1 50.9	− 0 32.3	+0.8620	0.5587	0.0621	+71	+15
ω^2 Scorpii	5	2.63	2.8	20 33.0	2 6.8	− 0 16.8	+1.0622	0.5588	0.0617	+70	+30
ν^1 Scorpii	6	2.63	2.1	19 8.6	4 13.3	+ 1 45.3	−0.5824	0.5595	0.0579	−14	−79
ν^2 Scorpii	4	+2.63	− 2.1	−19 9.2	4 13.7	+ 1·45.7	−0.5723	0.5595	−0.0579	−10	−78
ψ Ophiuchi	5	2.68	1.4	19 45.6	9 41.2	+ 7 2.1	−0.2060	0.5613	0.0480	+ 8	−49
ω Ophiuchi	5	2.75	1.1	21 12.8	13 15.8	+10 29.3	+1.1976	0.5625	0.0414	+69	+45
B. A. C. 5567	6	2.76	− 0.2	20 10.7	17 3.6	− 9 50.8	−0.0594	0.5637	0.0342	+15	−40
B. A. C. 5580	6½	2.75	0.0	19 41.9	17 39.5	− 9 16.1	−0.5952	0.5639	0.0331	−14	−80
B. A. C. 5663	6½	+2.82	+ 0.6	−20 13.1	22 46.8	− 4 19.4	−0.1828	0.5653	−0.0233	+ 7	−48
B. A. C. 5700	6½	2.82	1.2	19 21.1	16 0 25.4	− 2 44.3	−1.1426	0.5657	0.0200	−52	−90
Lalande 30971	6½	2.86	1.5	20 13.1	3 21.8	+ 0 6.0	−0.2660	0.5664	0.0144	+ 2	−53
B. A. C. 5758	6	2.90	1.2	21 23.9	4 24.6	+ 1 6.6	+0.9333	0.5666	0.0124	+69	+24
Yarnall 7137	6½	2.93	2.1	20 49.8	8 15.2	+ 4 49.1	+0.3414	0.5675	−0.0048	+36	−17
ξ Ophiuchi	5	+2.97	+ 2.4	−20 59.0	10 55.5	+ 7 23.7	+0.4987	0.5681	+0.0006	+46	− 9
B. A. C. 5866	6	+2.98	+ 2.6	−21 19.7	12 33.1	+ 7 57.9	+0.8706	0.5683	+0.0038	+69	+15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 6081	6	+3.11	+ 5.8	-20 19.7	17 3 59.4	- 0 8.5	+0.0976	0.5706	+0.0344	+24	-31
B. A. C. 6098	6	3.13	5.8	20 44.1	5 7.2	+ 0 56.9	+0.5684	0.5707	0.0368	+55	- 4
μ Sagittarii	4	3.19	6.7	21 5.2	9 57.1	+ 5 36.4	+1.1395	0.5712	0.0464	+69	+38
15 Sagittarii	5	3.18	6.7	20 45.6	10 35.3	+ 6 13.3	+0.8249	0.5712	0.0474	+70	+12
16 Sagittarii	6	3.18	6.9	20 25.2	10 35.9	+ 6 13.8	+0.4668	0.5712	0.0474	+49	-10
Lalande 33598	6	+3.15	+ 7.7	-18 50.3	11 46.5	+ 7 21.9	-1.1439	0.5713	+0.0499	-51	-90
Yarnall 7764	6½	3.17	8.0	18 54.5	13 18.3	+ 8 50.4	-0.9891	0.5714	0.0513	-37	-90
21 Sagittarii	5	3.23	7.6	20 36.1	14 59.3	+10 27.8	+0.8845	0.5715	0.0563	+70	+16
B. A. C. 6287	6	3.21	8.7	18 48.0	17 7.4	-11 28.6	-0.8859	0.5716	0.0607	-29	-90
B. A. C. 6292	6	3.22	8.7	18 58.8	17 36.9	-11 0.2	-0.6661	0.5717	0.0616	-16	-89
B. A. C. 6294	6	+3.21	+ 9.0	-18 28.8	17 40.3	-10 57.0	-1.1888	0.5717	+0.0616	-54	-90
B. A. C. 6309	6	3.21	9.0	18 27.0	18 25.3	-10 13.5	-1.1719	0.5717	0.0632	-52	-90
Yarnall 7918	6	3.28	9.5	19 23.6	22 37.5	- 6 10.3	+0.1008	0.5718	0.0715	+27	-31
Yarnall 7941	6½	3.28	10.1	18 28.9	23 55.8	- 4 54.8	-0.7586	0.5719	0.0739	-21	-90
Yarnall 7942	6	3.31	9.6	19 43.5	23 57.6	- 4 53.1	+0.5461	0.5719	0.0740	+56	- 5
Yarnall 8035	6½	+3.35	+10.7	-19 18.2	18 4 58.7	- 0 2.8	+0.4984	0.5719	+0.0835	+54	- 9
Yarnall 8088	6	3.37	11.1	19 16.1	7 22.1	+ 2 15.5	+0.6663	0.5719	0.0880	+67	+ 1
Yarnall 8122	6½	3.38	11.5	18 54.9	9 7.1	+ 3 56.6	+0.4536	0.5719	0.0914	+51	- 11
B. A. C. 6536	6	3.39	11.5	19 28.2	9 36.0	+ 4 24.5	+1.0772	0.5719	0.0922	+71	+30
d Sagittarii	5	3.42	12.3	19 9.5	13 39.4	+ 8 19.2	+1.1387	0.5718	0.0990	+71	+36
ρ^1 Sagittarii	4	+3.41	+12.9	-18 3.9	15 25.8	+10 1.8	+0.1810	0.5718	+0.1031	+35	-26
ρ^2 Sagittarii	5½	3.42	12.8	18 31.3	15 29.3	+10 5.2	+0.6625	0.5717	0.1031	+68	+ 1
B. A. C. 6658	6	3.45	13.2	18 35.6	18 11.8	-11 18.2	+1.0207	0.5717	0.1079	+72	+25
e^1 Sagittarii	6	3.46	15.0	16 33.5	23 42.5	- 5 59.3	-0.4660	0.5715	0.1177	+ 1	-67
e^2 Sagittarii	5	3.47	15.2	16 23.7	19 0 29.4	- 5 14.1	-0.5429	0.5714	0.1191	- 3	-74
B. A. C. 6746	6	+3.46	+15.5	-15 44.4	0 56.7	- 4 47.8	-1.1647	0.5713	+0.1200	-46	-90
g Sagittarii	5½	3.52	16.4	15 47.9	7 12.1	+ 1 14.2	-0.3181	0.5711	0.1305	+11	-56
B. A C. 6992	6½	3.60	18.1	15 9.0	17 8.1	+10 49.0	+0.3940	0.5705	0.1466	+53	-15
β Capricorni	3	3.60	18.1	15 8.9	17 14.1	+10 54.8	+0.4051	0.5705	0.1467	+53	-14
Yarnall 8844	6½	3.59	18.8	13 46.2	18 36.7	-11 45.6	-0.8044	0.5704	0.1487	-15	-90
B. A. C. 7087	5	+3.64	+19.3	-14 7.2	22 59.8	- 7 31.9	+0.2226	0.5701	+0.1553	+43	-24
B. A. C. 7221	6½	3.69	20.7	12 58.5	20 6 12.6	- 0 34.4	+0.2105	0.5696	0.1654	+43	-25
B. A. C. 7242	6	3.68	21.1	12 0.8	7 16.6	+ 0 27.3	-0.5912	0.5696	0.1668	0	-78
ν Aquarii	4½	3.81	22.1	11 50.5	14 29.1	+ 7 24.5	+0.4729	0.5693	0.1761	+62	-11
Yarnall 9283	6½	3.75	22.1	9 36.3	17 14.5	+10 4.1	-1.3041	0.5692	0.1795	-67	-90
14 Aquarii	6	+3.75	+23.1	- 9 42.3	17 27.2	+10 16.3	-1.1687	0.5692	+0.1797	-39	-90
17 Aquarii	6½	3.80	23.4	9 48.9	20 21.3	-10 55.8	-0.5254	0.5692	0.1830	+ 4	-71
19 Aquarii	6	3.80	23.4	10 14.6	21 20.6	- 9 58.5	+0.0892	0.5692	0.1841	+38	-32
ξ Aquarii	4½	3.82	24.6	8 22.6	21 2 50.8	- 4 40.1	-0.7652	0.5692	0.1899	- 8	-90
B. A. C. 7562	6½	3.86	24.4	9 34.3	5 58.5	- 1 39.1	+1.0375	0.5694	0.1930	+81	+24
c^1 Capricorni	5½	+3.87	+24.4	- 9 37.0	6 0.7	- 1 37.0	+1.0902	0.5694	+0.1930	+81	+28
30 Aquarii	5½	3.91	26.0	7 5.1	14 1.9	+ 6 7.2	+0.1214	0.5697	0.2000	+42	-30
B. A. C. 7744	6	3.93	26.9	5 17.7	18 11.1	+10 7.5	-0.8333	0.5699	0.2031	-11	-90
44 Aquarii	5½	3.95	27.1	5 58.1	20 5.3	+11 57.7	+0.2287	0.5700	0.2044	+49	-24
51 Aquarii	5½	3.98	27.0	5 25.6	23 9.3	- 9 4.8	+0.3154	0.5702	0.2064	+55	-19
κ Aquarii	5	+4.04	+27.5	- 4 49.7	22 5 6.9	- 3 19.8	+0.9576	0.5702	+0.2097	+85	+18
3 Piscium	6	4.12	28.8	0 26.4	15 4.8	+ 6 16.8	-1.2984	0.5722	0.2133	-50	-90
B. A. C. 8152	6½	4.21	28.8	- 0 21.0	23 0 58.6	- 8 10.7	+0.7330	0.5740	0.2146	+86	+ 4
κ Piscium	4½	4.22	29.1	+ 0 37.1	2 26.8	- 6 45.8	+0.0909	0.5743	0.2146	+42	-31
9 Piscium	6½	4.22	29.0	0 29.0	2 35.1	- 6 37.7	+0.2545	0.5743	0.2147	+52	-23
15 Piscium	6½	+4.25	+29.1	+ 0 40.2	6 7.7	- 3 12.7	+0.8297	0.5751	+0.2145	+90	+10
16 Piscium	6	4.26	29.3	1 27.3	6 31.5	- 2 49.8	+0.1381	0.5752	0.2144	+44	-29
λ Piscium	5	4.27	29.1	1 8.3	8 57.2	- 0 29.4	+0.9703	0.5758	0.2142	+90	+19
19 Piscium	6	4.30	29.3	2 50.4	10 48.6	+ 1 18.0	-0.3127	0.5762	0.2138	+19	-55
B. A. C. 8276	6½	4.30	29.1	1 34.1	11 50.6	+ 2 17.8	+1.1631	0.5765	0.2136	+90	+34
22 Piscium	6½	+4.31	+29.0	+ 2 16.9	13 11.3	+ 3 35.5	+0.7450	0.5769	+0.2132	+90	+ 5
45 Piscium	6	+4.47	+28.8	+ 7 2.8	24 3 29.5	- 6 37.7	-0.9412	0.5808	+0.2070	-17	-83

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
51 Piscium	6½	+4.47	+28.4	+ 6 18.8	24 6 18.7	- 3 54.7	+0.3646	0.5816	+0.2051	+59	-15
δ Piscium	4½	4 52	27.7	6 57.0	13 7.4	+ 2 38.9	+1.1156	0.5838	0.1998	+90	+32
B. A. C. 286	6½	4.58	27.1	8 11.7	18 52.0	+ 8 10.6	+1.0231	0.5856	0 1946	+90	+25
Yarnall 585	6½	4.62	26 9	9 17.1	21 17.4	+10 30.5	+0.4163	0.5864	0.1926	+62	-11
Yarnall 592	6½	4.61	26.9	9 6.5	21 31.5	+10 44.2	+0.6359	0.5865	0.1919	+82	+ 1
B. A. C. 454	6	+4.70	+25.5	+10 17.2	25 6 53.0	- 4 15.5	+1.2215	0.5895	+0.1809	+90	+44
π Piscium	6	4.73	25.1	11 32.7	9 5.1	- 2 8.4	+0.3759	0.5901	0.1781	+60	-14
Yarnall 931	6½	4.81	23.1	12 54.8	19 25.3	+ 7 48.1	+0.7900	0.5929	0.1632	+90	+13
19 Arietis	6	4.87	22.2	14 43.9	23 37.4	+11 50.5	-0.3389	0.5939	0.1564	+18	-50
29 Arietis	6½	4.90	20.5	14 31.0	26 7 36.1	- 4 29.3	+1.0693	0.5956	0.1427	+90	+35
π Arietis	6	+4.99	+18.7	+16 58.7	14 7.2	+ 1 46.6	-0.4864	0.5968	+0.1304	+ 9	-67
ρ^2 Arietis	6	5.01	18.0	17 51.5	16 42.4	+ 4 15.7	-1.0325	0.5972	0.1256	-26	-72
ρ^3 Arietis	6	5.02	17.9	17 33.4	16 56.7	+ 4 29.4	-0.7025	0.5974	0.1235	- 3	-72
53 Arietis	6	5.02	16.8	17 25.7	21 20.2	+ 8 42.6	-0.0444	0.5978	0.1164	+34	-28
54 Arietis	6½	5.04	16.6	18 20.7	21 41.2	+ 9 2.9	-0.9200	0.5978	0.1158	-18	-72
B. A. C. 1096	6½	+5.03	+13.7	+17 26.8	27 7 56.1	- 5 6.3	+1.0580	0.5981	+0.0964	+90	+39
13 Tauri	6½	5.07	12.3	19 19.5	11 9.5	- 2 0.4	-0.5351	0.5980	0.0874	+ 6	-56
B. A. C. 1242	6½	5.07	10.2	19 52.2	18 36.9	+ 5 9.5	-0.4956	0.5973	0.0709	+ 8	-52
A^2 Tauri	6	5.10	9.5	20 41.5	20 15.2	+ 6 44.0	-1.2131	0.5971	0.0674	-47	-70
ω^1 Tauri	6	5.04	9.4	19 17.9	21 49.6	+ 8 14.6	+0.2982	0.5969	0.0638	+55	- 5
ω^2 Tauri	5½	+5.06	+ 8.3	+20 17.4	28 1 2.6	+11 20.1	-0.5106	0.5964	+0.0567	+ 8	-52
53 Tauri	6	5.09	8.1	20 51.5	1 53.7	-11 50.8	-1.0409	0.5962	0.0549	-28	-69
B. A. C. 1361	6½	5.00	7.6	18 46.3	4 8.0	- 9 41.8	+1.1937	0.5958	0.0498	+90	+55
ε Tauri	3½	5.00	7.2	18 55.2	5 35.8	- 8 17.3	+1.1153	0.5955	0.0464	+90	+48
ι Tauri	5	5.05	2.6	21 25.2	19 26.1	+ 5 0.9	-1.0097	0.5914	0.0154	-26	-69
B. A. C. 1563	6½	+4.93	+ 2.7	+19 38.6	20 28.0	+ 6 0.5	+0.8273	0.5909	+0.0123	+90	+30
l Tauri	5½	4.95	2.3	20 15.7	21 22.7	+ 6 53.1	+0.2042	0.5907	0.0111	+49	- 5
105 Tauri	6	4.99	2.0	21 32.9	21 23.8	+ 6 54.1	-1.1156	0.5907	+0.0110	-36	-69
B. A. C. 1651	6½	4.89	+ 0.9	19 41.5	29 2 45.0	-11 56.8	+0.8185	0.5884	-0.0009	+90	+31
B. A. C. 1733	6½	4.87	- 0.8	20 23.2	7 57.6	- 6 56.0	+0.0698	0.5860	0.0122	+41	-12
ζ Tauri	3½	+4.88	- 1.5	+21 4.1	9 36.0	- 5 21.4	-0.6553	0.5852	-0.0147	- 1	-62
B. A. C. 1835	6½	4.81	2.5	20 49.5	14 3.8	- 1 3.5	-0.4991	0.5829	0.0251	+ 8	-48
B. A. C. 1867	6½	4.77	3.0	20 16.2	16 8.7	+ 0 56.7	+0.0211	0.5817	0.0296	+38	-17
χ^1 Orionis	4½	4.76	3.1	20 15.1	16 36.1	+ 1 23.1	+0.0251	0.5815	0.0305	+38	-16
χ^2 Orionis	6	4.75	3.0	19 43.5	16 50.3	+ 1 36.8	+0.5662	0.5813	0.0311	+77	+12
χ^3 Orionis	5	+4.72	- 4.0	+19 41.4	20 25.2	+ 5 3.8	+0.4801	0.5793	-0.0383	+69	+ 7
χ^4 Orionis	5	4.74	4.3	20 8.3	20 36.4	+ 5 14.5	+0.0052	0.5792	0.0387	+37	-18
68 Orionis	6	4.67	5.1	19 48.8	30 0 3.0	+ 8 33.6	+0 1994	0.5772	0.0456	+49	- 8
71 Orionis	5½	4.65	5.3	19 11.6	1 16.2	+ 9 44.1	+0.7911	0.5765	0.0480	+90	+24
15 Geminorum	6	4.62	7.2	20 51.5	6 46.5	- 8 57.5	-1.2485	0.5731	0.0587	-54	-69
16 Geminorum	6	+4.61	- 7.1	+20 33.8	6 51.2	- 8 53.0	-0.9439	0.5731	-0.0589	-20	-70
ν Geminorum	4½	4.60	7.1	20 17.0	7 17.9	- 8 27.3	-0.6755	0.5729	0.0598	- 2	-66
B. A. C. 2432	6½	4.24	12.0	18 29.7	31 7 20.5	- 9 15.0	-0.7477	0.5573	0.1016	- 6	-72
Lalande 14620	6	4.15	12.5	17 19.4	11 21 7	- 5 22.0	+0.0814	0.5546	0.1078	+41	-21
f Geminorum	6	4.12	13.3	17 56.3	14 54.0	- 1 56.7	-0.9679	0.5523	0.1132	-21	-72
1 Cancri	6	+3.97	-14.2	+16 6.0	23 9.1	+ 6 2.0	+0.0233	0.5466	-0.1244	+38	-27
NOVEMBER.											
5 Cancri	6	+3.95	-14.7	+16 46.5	1 1 16.6	+ 8 5.6	-0.9709	0.5453	-0.1267	-21	-74
Yarnall 3294	6½	3.86	14.5	14 41.3	4 27.0	+11 9.8	+0.8686	0.5433	0.1313	+90	+21
29 Cancri	6	3.73	16.0	14 35.8	14 24.8	- 3 11.4	-0.3971	0.5375	0.1430	+15	-54
B. A. C. 2872	6½	3.68	16.1	13 39.4	16 56.9	- 0 44.1	+0.2563	0.5362	0.1458	+52	-17
A^1 Cancri	6	3.61	16.4	13 5 9	21 38.3	+ 3 48.6	+0.1685	0.5335	0.1507	+46	-22
A^2 Cancri	6	+3.58	-16.4	+12 32.3	23 30.6	+ 5 37.5	+0.4960	0.5325	-0.1525	+69	- 4
60 Cancri	6	3.52	16.8	12 4.3	2 4 1.4	+10 0.0	+0.3068	0.5300	0.1569	+55	-15
α Cancri	4	+3.51	-17.1	+12 18.5	5 18.4	+11 14.6	-0.1541	0.5294	-0.1579	+28	-41

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. $\Delta\alpha$	Red'ns from 1882.0. $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
κ Cancri	5	+3.42	-17.2	+11 8.2	2 10 1.5	- 8 10.8	+0.3710	0.5268	-0.1615	+59	-12
B. A. C. 3122	6½	3.44	17.7	12 2.3	11 2.7	- 7 11.4	-0.7839	0.5264	0.1629	- 7	-78
ω Leonis	6	3.29	17.6	9 33.9	20 41.3	+ 2 9.9	+0.3229	0.5224	0.1702	+46	-16
3 Leonis	6	3.28	17.3	8 41.8	20 43.3	+ 2 11.8	+1.2697	0.5224	0.1703	+90	+50
k Leonis	6	3.27	18.0	10 13.8	22 30.2	+ 3 55.6	-0.7180	0.5217	0.1715	- 3	-80
B. A. C. 3336	5	+3.16	-17.5	+ 7 14.9	3 5 58.1	+11 10 5	+1.2644	0.5189	-0.1763	+90	+48
14 Sextantis	6	3.03	17.8	6 10.9	16 53.6	- 2 12.9	+0.4852	0.5157	0.1819	+68	- 9
16 Sextantis	6	3.02	18.1	6 44.6	18 11.7	- 0 57.0	-0.3727	0.5154	0.1825	+16	-58
19 Sextantis	6½	2.98	17.7	5 11.5	20 6.8	+ 0 54.8	+0.9901	0.5149	0.1834	+90	+21
Yarnall 4339	6½	2.91	17.7	4 31.6	4 3 26.6	+ 8 2.1	+0.3721	0.5133	0.1862	+59	-16
34 Sextantis	6	+2.81	-17.9	+ 4 11.6	12 9.0	- 7 30.3	-0.8907	0.5120	-0.1886	-13	-86
36 Sextantis	6	2.80	17.5	3 6.2	13 31.5	- 6 10.0	+0.0579	0.5118	0.1890	+40	-33
B. A. C. 3726	6	2.76	17.1	1 38.8	17 21.5	- 2 26.5	+0.9469	0.5115	0.1897	+90	+17
55 Leonis	6	2.74	17.1	1 21.7	19 14.1	- 0 37.1	+0.9074	0.5114	0.1900	+90	+15
p^2 Leonis	6	2.71	16.7	0 37.8	23 32.0	+ 3 33.6	+0.9003	0.5112	0.1905	+90	+14
p^5 Leonis	5	+2.67	-16.9	+ 0 34.1	5 5 2.4	+ 8 54.8	-0.0804	0.5113	-0.1909	+32	-41
B. A. C. 3901	6	2.62	16.3	- 1 3.3	12 42.7	- 7 37.8	+0.2546	0.5116	0.1910	+51	-23
B. A. C. 3903	6½	2.62	16.5	0 15.2	12 47.6	- 7 33.1	-0.6514	0.5116	0.1910	+ 1	-83
B. A. C. 3909	6	2.61	16.6	0 12.2	13 31.5	- 6 50.3	-0.8453	0.5116	0.1910	-11	-90
B. A. C. 3955	5½	2.58	16.0	1 47.3	18 24.1	- 2 5.9	-0.0179	0.5120	0.1906	+35	-38
χ Virginis	5	+2.43	-13.5	- 7 21.0	7 2 58.7	+ 5 33.1	+0.0639	0.5189	-0.1806	+39	-33
B. A. C. 4259	6	2.43	13.5	7 23.2	3 3.4	+ 5 37.7	+0.0913	0.5190	0.1806	+40	-32
28 Virginis	6	2.41	13.6	6 51.3	4 24.6	+ 6 56.6	-0.7413	0.5194	0.1799	- 6	-90
ψ Virginis	5	2.41	12.9	8 54.1	10 54.1	-10 45.3	+0.3639	0.5217	0.1763	+56	-17
g Virginis	6	2.39	12.2	10 6.7	17 56.1	- 3 55.6	+0.4758	0.5243	0.1717	+63	-11
50 Virginis	6	+2.38	-12.2	- 9 42.2	18 53.9	- 2 59.5	-0.1412	0.5255	-0.1697	+26	-45
58 Virginis	6	2.38	11.9	9 55.6	22 52.2	+ 0 51.8	-0.5671	0.5263	0.1682	+ 3	-75
α Virginis	1	2.37	11.6	10 32.9	8 2 49.4	+ 4 42.0	-0.5415	0.5263	0.1682	+ 4	-73
i Virginis	5½	2.39	11.2	12 5.8	3 35.7	+ 5 26.9	+1.0354	0.5282	0.1645	+78	+24
B. A. C. 4531	6	2.39	10.8	12 36.7	7 38.0	+ 9 21.9	+0.9450	0.5301	0.1609	+78	+18
86 Virginis	6	+2.35	-10.5	-11 50.3	13 18.8	- 9 7.6	-0.8058	0.5326	-0.1556	-13	-90
				NEW	*MOON.*						
β^1 Scorpii	2	2.54	2.0	19 28.9	11 7 17.2	+ 6 42.7	-0.0117	0.5633	0.0633	+21	-37
ω^1 Scorpii	4½	2.56	1.9	20 20.9	7 53.1	+ 7 17.4	+0.8833	0.5635	0.0621	+70	+16
ω^2 Scorpii	5	+2.57	- 1.9	-20 33.0	8 8.8	+ 7 32.6	+1.0829	0.5636	-0.0617	+70	+32
ν^2 Scorpii	4	2.55	1.5	19 9.2	10 14.1	+ 9 33.5	-0.5432	0.5644	0.0580	- 9	-75
ψ Ophiuchi	5	2.58	0.8	19 45.6	15 37.5	- 9 14.2	-0.1762	0.5663	0.0479	+10	-47
ω Ophiuchi	5	2.62	- 0.2	21 12.8	19 9.5	- 5 49.6	+1.2232	0.5674	0.0412	+69	+50
B. A. C. 5567	6	2.62	+ 0.5	20 10.7	22 54.3	- 2 12.7	-0.0270	0.5686	0.0341	+17	-38
B. A. C. 5580	6½	+2.61	+ 0.5	-19 41.8	23 29.9	- 1 38.3	-0.5610	0.5687	-0.0329	-12	-77
B. A. C. 5663	6½	2.64	1.3	20 12.9	12 4 33.5	+ 3 14.7	-0.1478	0.5701	0.0230	+ 9	-45
B. A. C. 5700	6½	2.64	1.6	19 21.1	6 10.5	+ 4 48.3	-1.1038	0.5705	0.0191	-50	-90
Lalande 30971	6½	2.66	2.0	20 13.1	9 5.3	+ 7 36.9	-0.2292	0.5711	0.0141	+ 4	-51
B. A. C. 5758	6	2.70	2.0	21 24.0	10 7.5	+ 8 36.9	+1.0224	0.5713	0.0121	+69	+27
Yarnall 7137	6½	+2.70	+ 2.7	-20 49.8	13 55.5	-11 43.2	+0.3775	0.5720	-0.0045	+38	-15
ξ Ophiuchi	5	2.73	3.1	20 59.0	16 34.2	- 9 10.1	+0.5354	0.5725	+0.0009	+49	- 6
B. A. C. 5866	6	2 74	3.4	21 19.7	18 10.7	- 7 37.1	+0.9067	0.5727	0.0041	+69	+18
B. A. C. 6081	6	2.81	6.1	20 19.6	13 9 29.4	+ 7 8.8	+0.1404	0.5742	0.0350	+26	-28
B. A. C. 6098	6	2.83	6.3	20 44.0	10 36.8	+ 8 13.8	+0.6110	0.5742	0.0372	+59	- 2
μ Sagittarii	4	+2.87	+ 7.0	-21 5.2	15 25.0	-11 8.4	+1.1830	0.5742	+0.0468	+69	+43
15 Sagittarii	5	2.86	7.2	20 45.6	16 3.0	-10 31.7	+0.8688	0.5742	0.0482	+70	+15
16 Sagittarii	6	2.86	7.2	20 25.2	16 3.6	-10 31.1	+0.5107	0.5742	0.0482	+51	- 8
Lalande 33598	6	2.82	7.8	18 50.3	17 13.8	- 9 23.5	-1.0995	0.5741	0.0504	-46	-90
Yarnall 7764	6½	2.83	8.0	18 54.5	18 45.2	- 7 55.4	-0.9445	0.5741	0.0534	-34	-90
21 Sagittarii	5	+2.89	+ 7.8	-20 36.1	20 25.8	- 6 18.4	+0.9296	0.5741	+0.0568	+70	+19
B. A. C. 6287	6	+2.87	+ 8.6	-18 48.0	22 33.5	- 4 15.2	-0.8406	0.5740	+0.0610	-26	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 6292	6	+2.87	+ 8.7	-18 58.8	13 23 2.9	- 3 46.9	-0.6209	0.5740	+0.0620	-14	-83
B. A. C. 6294	6	2.86	8.9	18 28.8	23 6.3	- 3 43.7	-1.1437	0.5740	0.0621	-50	-90
B. A. C. 6309	6	2.87	9.0	18 27.0	23 51.1	- 3 0.4	-1.1272	0.5739	0.0635	-48	-90
Yarnall 7918	6	2.92	9.5	19 23.6	14 4 2.8	+ 1 2.2	+0.1472	0.5739	0.0718	+30	-28
Yarnall 7941	6½	2.91	9.9	18 28.9	5 20.9	+ 2 17.5	-0.7132	0.5736	0.0742	-17	-90
Yarnall 7942	6	+2.94	+ 9.6	-19 43.5	5 22.7	+ 2 19.2	+0.5929	0.5736	+0.0742	+60	- 3
Yarnall 8035	6½	2.96	10.6	19 18.2	10 23.7	+ 7 9.5	+0.5464	0.5731	0.0838	+57	- 6
Yarnall 8088	6	2.98	11.0	19 16.1	12 47.3	+ 9 27.9	+0.7152	0.5729	0.0882	+71	+ 4
Yarnall 8122	6½	2.99	11.3	18 54.9	14 32.5	+11 9.3	+0.5023	0.5727	0.0917	+55	- 8
B. A. C. 6536	6	3.00	11.3	19 28.2	15 1.4	+11 37.2	+1.1280	0.5727	0.0924	+71	+35
d Sagittarii	5	+3.02	+12.0	-19 9.5	19 5.6	- 8 27.3	+1.1910	0.5722	+0.0997	+71	+42
ρ^1 Sagittarii	4	3.01	12.6	18 3.9	20 52.3	- 6 44.4	+0.2276	0.5719	0.1030	+38	-24
ρ^2 Sagittarii	5½	3.02	12.5	18 31.3	20 55.9	- 6 40.9	+0.7131	0.5719	0.1031	+72	+ 4
B. A. C. 6658	6	3.05	12.9	18 35.6	23 39.0	- 4 3.7	+1.0897	0.5715	0.1080	+72	+31
e^1 Sagittarii	6	3.05	14.2	16 33.5	15 5 11.9	+ 1 17.5	-0.4211	0.5704	0.1181	+ 4	-64
e^2 Sagittarii	5	+ 3.06	+14.4	-16 23.7	5 59.2	+ 2 3.1	-0.4974	0.5704	+0.1190	0	-70
B. A. C. 6746	6	3.05	14.7	15 44.5	6 26.7	+ 2 29.6	-1.1225	0.5703	0.1197	-42	-90
g Sagittarii	5½	3.10	15.5	15 47.9	12 45.5	+ 8 35.0	-0.2721	0.5691	0.1300	+13	-53
B. A. C. 6992	6½	3.18	17.1	15 9.1	22 48.9	- 5 42.8	+0.4448	0.5673	0.1456	+56	-12
β Capricorni	3	3.18	17.1	15 8.9	22 55.1	- 5 36.8	+0.4562	0.5673	0.1457	+57	-11
Yarnall 8844	6½	+3.17	+17.8	-13 46.2	16 0 18.7	- 4 16.2	-0.7634	0.5670	+0.1476	-13	-90
B. A. C. 7087	5	3.22	18.3	14 7.2	4 46.0	+ 0 1.7	+0.2719	0.5661	0.1540	+46	-21
B. A. C. 7221	6½	3.27	19.6	12 58.5	12 6.7	+ 7 7.1	+0.2592	0.5647	0.1638	+46	-22
B. A. C. 7242	6	3.27	20.1	12 0.8	13 11.8	+ 8 9.9	-0.5513	0.5647	0.1652	+ 2	-74
ν Aquarii	4½	3.33	20.9	11 50.6	20 33.6	- 8 43.6	+0.5234	0.5632	0.1741	+66	- 8
Yarnall 9283	6½	+3.33	+21.9	- 9 36.3	23 22.8	- 6 0.2	-1.2753	0.5628	+0.1772	-52	-90
14 Aquarii	6	3.33	21.9	9 42.1	23 35.8	- 5 47.7	-1.1382	0.5628	0.1774	-36	-90
17 Aquarii	6½	3.37	22.2	9 48.9	17 2 34.1	- 2 55.5	-0.4881	0.5624	0.1806	+ 7	-68
19 Aquarii	6	3.39	22.1	10 14.6	3 35.0	- 1 56.7	+0.1345	0.5622	0.1817	+41	-29
ξ Aquarii	4½	3.42	23.3	8 22.6	9 13.8	+ 3 30.5	-0.7323	0.5616	0.1872	- 6	-90
B. A. C. 7562	6½	+3.46	+23.0	- 9 34.3	12 26.6	+ 6 36.6	+1.0937	0.5613	+0.1901	+81	+28
c^1 Capricorni	5½	3.47	23.0	9 37.0	12 28.9	+ 6 38.8	+1.1471	0.5613	0.1901	+81	+33
30 Aquarii	5½	3.53	24.4	7 5.1	20 44.1	- 9 23.0	+0.1633	0.5609	0.1959	+44	-28
B. A. C. 7744	6	3.56	25.3	5 17.7	18 1 1.3	- 5 14.5	-0.8068	0.5607	0.1995	- 9	-90
44 Aquarii	5½	3.59	25.1	5 58.1	2 59.1	- 3 20.9	+0.2707	0.5607	0.2008	+51	-22
51 Aquarii	5½	+3.62	+25.5	- 5 25.6	6 8.9	- 0 17.5	+0.3579	0.5609	+0.2026	+57	-17
κ Aquarii	5	3.68	26.0	4 49.7	12 18.4	+ 5 39.3	+1.0088	0.5609	0.2056	+85	+21
3 Piscium	6	3.80	27.7	0 26.4	22 37.1	- 8 23.2	-1.2871	0.5618	0.2092	-48	-90
B. A. C. 8152	6½	3.91	27.7	- 0 21.0	19 8 52.2	+ 1 30.7	+0.7750	0.5633	0.2104	+73	+ 6
κ Piscium	4½	3.94	27.9	+ 0 37.0	10 23.6	+ 2 59.0	+0.1212	0.5637	0.2105	+43	-30
9 Piscium	6½	+3.94	+27.9	+ 0 28.9	10 32.2	+ 3 7.2	+0.2875	0.5637	+0.2104	+54	-21
15 Piscium	6½	3.97	27.9	0 40.1	14 12.6	+ 6 40.0	+0.8716	0.5645	0.2102	+90	+12
16 Piscium	6	3.99	28.1	1 27.3	14 37.2	+ 7 3.7	+0.1681	0.5646	0.2102	+46	-27
λ Piscium	5	4.01	27.9	1 8.3	17 8.2	+ 9 29.5	+1.0139	0.5651	0.2098	+90	+22
19 Piscium	6	4.04	28.3	2 50.4	19 3.7	+11 21.0	-0.2917	0.5655	0.2095	+21	-54
B. A. C. 8376	6½	+4.05	+27.8	+ 1 33.1	20 7.9	-11 37.0	+1.2255	0.5658	+0.2093	+90	+40
22 Piscium	6½	4.07	28.0	2 16.9	21 31.5	-10 16.4	+0.7834	0.5661	0.2090	+90	+ 7
45 Piscium	6	4.30	28.0	7 2.8	20 12 20.1	+ 4 0.9	-0.9350	0.5705	0.2029	-17	-83
51 Piscium	6½	4.32	27.9	6 18.7	15 15.0	+ 6 49.5	+0.3894	0.5715	0.2012	+60	-14
δ Piscium	4½	4.42	27.2	6 57.0	22 17.3	-10 23.2	+1.1495	0.5740	0.1964	+90	+35
B. A. C. 286	6½	+4.50	+26.8	+ 8 11.7	21 4 12.8	- 4 40.6	+1.0532	0.5762	+0.1914	+90	+28
Yarnall 585	6½	4.55	26.7	9 17.1	6 42.6	- 2 16.3	+0.4367	0.5772	0.1890	+64	-10
Yarnall 592	6½	4.56	26.6	9 6.5	6 57.1	- 2 2.2	+0.6592	0.5773	0.1887	+85	+ 2
B. A. C. 454	6	4.70	25.2	10 17.2	16 34.7	+ 7 14.2	+1.2486	0.5812	0.1783	+90	+49
π Piscium	6	4.75	25.1	11 32.7	18 50.4	+ 9 24.9	+0.3912	0.5821	0.1754	+61	-11
Yarnall 931	6½	+4.89	+23.3	+12 54.8	22 5 25.8	- 4 23.3	+0.8066	0.5863	+0.1610	+90	+14
19 Arietis	6	+4.98	+22.6	+14 43.9	9 43.4	- 0 15.4	-0.3349	0.5873	+0.1546	+18	-49

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
29 Arietis	6½	+5.07	+20.5	+14 31.0	22 17 51.2	+ 7 34.0	+1.0839	0.5907	+0.1412	+90	+36
π Arietis	6	5.19	19.1	16 58.7	23 0 28.4	-10 4.1	-0.4861	0.5927	0.1295	+ 9	-57
ρ^2 Arietis	6	5.22	18.5	17 51.5	3 5.7	- 7 32.8	-1.0356	0.5934	0.1247	-27	-72
ρ^3 Arietis	6	5.23	18.5	17 33.4	3 20.2	- 7 18.9	-0.7033	0.5935	0.1243	- 3	-72
53 Arietis	6	5.27	17.1	17 25.7	7 46.9	- 3 2.5	-0.0416	0.5946	0.1158	+34	-28
54 Arietis	6½	+5.30	+17.1	+18 20.8	8 8.2	- 2 42.0	-0.9226	0.5947	+0.1151	-18	-72
B A. C. 1096	6½	5.36	14.0	17 26.8	18 28.4	+ 7 14.2	+1.0641	0.5968	0.0940	+90	+40
13 Tauri	6½	5.42	13.1	19 19.5	21 42.9	+10 21.0	-0.5356	0.5973	0.0872	+ 6	-57
B. A. C. 1242	6½	5.48	10.9	19 52.2	24 5 11.6	- 6 27.6	-0.4957	0.5979	0.0710	+ 9	-52
A^2 Tauri	6	5.51	10.4	20 41.5	6 49.9	- 4 53.1	-1.2145	0.5979	0.0675	-47	-70
ω^1 Tauri	6	+5.46	+ 9.7	+19 17.9	8 24.3	- 3 22.5	+0.2991	0.5979	+0.0640	+55	- 5
ω^2 Tauri	5½	5.51	8.8	20 17.4	11 37.1	- 0 17.1	-0.5105	0.5979	0.0568	+ 8	-52
53 Tauri	6	5.54	8.5	20 51.5	12 28.2	+ 0 31 9	+1.0399	0.5979	0.0549	-28	-69
B. A. C. 1361	6½	5.47	7.7	18 46.3	14 42.1	+ 2 40.6	-1.1937	0.5978	0.0499	+90	+56
ε Tauri	3½	5.47	7.1	18 55.2	16 9.7	+ 4 4.8	+1.1158	0.5978	0.0466	+90	+49
ι Tauri	5	+5.56	+ 2.6	+21 25.2	25 5 54.8	- 6 42.2	-1.0065	0.5950	+0.0155	-26	-69
B. A. C. 1563	6½	5.49	2.3	19 38.6	6 46.1	- 5 53.3	+0.8266	0.5948	0.0132	+90	+30
l Tauri	5½	5.51	2.1	20 15.7	7 50.3	- 4 51.3	+0.2044	0.5945	0.0112	+49	- 5
105 Tauri	6	5.56	2.0	21 32.9	7 51.4	- 4 50.2	-1.1115	0.5945	+0.0111	-35	-69
B. A. C. 1651	6½	5.49	+ 0.2	19 41.5	13 9.3	+ 0 15.6	+0.8172	0.5929	-0.0008	+90	+30
B. A. C. 1733	6½	+5.49	- 1.4	+20 23.2	18 17.9	+ 5 12.3	+0.0712	0.5911	-0.0122	+41	-12
ζ Tauri	3½	5.52	2.0	21 4.1	19 55.0	+ 6 45.7	-0.6536	0.5905	0.0157	- 1	-61
B. A. C. 1835	6½	5.49	3.3	20 49.5	26 0 19.0	+10 59.8	-0.4942	0.5886	0.0254	+ 8	-48
B. A. C. 1867	6½	5.46	4.0	20 16.1	2 21.9	-11 2.0	+0.0233	0.5877	0.0297	+38	-17
χ^1 Orionis	4½	5.45	4.1	20 15.1	2 48.9	-10 36.0	+0.0273	0.5875	0.0307	+38	-16
χ^2 Orionis	6	+5.43	- 4.1	+19 43.5	3 2.9	-10 22.5	+0.5654	0.5874	-0.0312	+77	+13
χ^3 Orionis	5	5.41	5.2	19 41.4	6 34.3	- 6 59.1	+0.4800	0.5857	0.0386	+69	+ 7
χ^4 Orionis	5	5.43	5.3	20 8.3	6 45.3	- 6 48.4	+0.0081	0.5856	0.0390	+37	-18
68 Orionis	6	5.39	6.3	19 48.8	10 8.3	- 3 33.0	+0.2010	0.5838	0.0460	+49	- 8
71 Orionis	5½	5.37	6.6	19 11.6	11 20.3	- 2 23.7	+0.7894	0.5832	0.0485	+90	+24
15 Geminorum	6	+5.39	- 8.5	+20 51.5	16 44.5	+ 2 48.6	-1.2354	0.5801	-0.0594	-51	-69
16 Geminorum	6	5.38	8.4	20 33.8	16 49.1	+ 2 53.0	-0.9333	0.5800	0.0594	-21	-70
ν Geminorum	4½	5.36	8.5	20 17.0	17 15.3	+ 3 18.3	-0.6666	0.5798	0.0604	- 2	-65
B. A. C. 2432	6½	5.06	14.6	18 29.6	27 16 48.0	+ 2 0.5	-0.7328	0.5646	0.1027	- 5	-72
Lalande 14620	6	4.98	15.4	17 19.4	20 43.9	+ 5 48.2	+0.0898	0.5619	0.1089	+42	-21
f Geminorum	6	+4.97	-16.3	+17 56.2	28 0 11.5	+ 9 8.8	-0.9491	0.5596	-0.1142	-19	-72
1 Cancri	6	4.82	17.6	16 6.0	8 15.7	- 7 3.4	+0.0349	0.5540	0.1259	+39	-26
5 Cancri	6	4.81	18.1	16 46.5	10 20.5	- 5 2.8	-0.9502	0.5526	0.1286	-19	-74
Yarnall 3294	6½	4.71	18.2	14 41.2	13 26.7	- 2 2.6	+0.8740	0.5505	0.1326	+90	+11
29 Cancri	6	4.61	19.9	14 35.7	23 11.9	+ 7 23.6	-0.3783	0.5439	0.1445	+16	-52
B. A. C. 2872	6½	+4.55	-20.0	+13 39.3	29 1 40.9	+ 9 48.0	+0.2817	0.5423	-0.1473	+54	-15
A^1 Cancri	6	4.48	20.5	13 5.8	6 16.5	- 9 45.3	+0.1841	0.5394	0.1522	+48	-21
A^2 Cancri	6	4.45	20.6	12 32.2	8 6.6	- 7 58.6	+0.5091	0 5383	0.1540	+70	- 3
60 Cancri	6	4.38	21.2	12 4.2	12 32.2	- 3 41.4	+0.3229	0.5356	0.1583	+55	-14
α Cancri	4	4.38	21.4	12 18.5	13 47.8	- 2 28.1	-0.1345	0.5349	0.1594	+29	-40
κ Cancri	5	+4.30	-21.6	+11 8.2	18 25.8	+ 2 1.4	+0.3877	0.5323	-0.1636	+61	-11
B. A. C. 3122	6½	4.31	22.0	12 2.3	19 26.9	+ 3 0.5	-0.7582	0.5318	0.1644	- 6	-73
ω Leonis	6	4.15	22.2	9 33.8	30 4 54.9	-11 48.6	+0.3422	0.5268	0.1715	+57	-15
3 Leonis	6	4.14	22.0	8 41.8	4 56.8	-11 46.8	+1.2829	0.5268	0.1715	+90	+52
λ Leonis	6	4.13	22.6	10 13.7	6 41.9	-10 4.9	-0.6885	0.5260	0.1727	- 1	-79
B. A. C. 3336	5	+4.01	-22.2	+ 7 14.8	14 3.6	- 2 56.2	+1.2800	0.5226	-0.1773	+90	+50

DECEMBER.

14 Sextantis	6	+3 87	-22.7	+ 6 10.8	1 0 50.7	+ 7 32.0	+0.5093	0.5184	-0.1827	+70	- 8
16 Sextantis	6	3.87	23.0	6 44.5	2 8.2	+ 8 47.3	-0.3441	0.5179	0.1833	+18	-56
19 Sextantis	6½	+3.83	-22.5	+ 5 11.5	4 2.1	+10 37.9	+1.0118	0.5173	-0.1841	+90	+23

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
Yarnall 4339	6½	+3.76	-22.7	+ 4 31.5	1 11 17.9	- 6 18.8	+0.3982	0.5151	-0.1866	+61	-14
34 Sextantis	6	3.67	23.0	4 11.6	19 56.3	+ 2 4.8	-0.8572	0.5131	0.1889	-11	-86
36 Sextantis	6	3.66	22.6	3 6.1	21 18.3	+ 3 24.5	+0.0873	0.5128	0.1892	+42	-31
B. A. C. 3726	6	3.61	22.2	1 38.7	2 1 6.9	+ 7 6.6	+0.9743	0.5122	0.1898	+90	+19
55 Leonis	6	3.59	22.1	1 21 6	2 59.1	+ 8 55.6	+0.9345	0.5119	0.1901	+90	+16
p^2 Leonis	6	+3.55	-21.8	+ 0 37.7	7 15.8	-10 54.9	+0.9286	0.5114	-0.1904	+90	+16
p^6 Leonis	5	3.50	21.9	+ 0 34.0	12 45.2	- 5 34.8	-0.0485	0.5110	0.1907	+34	-39
B. A. C. 3901	6	3.42	21.2	- 1 3.4	20 24 7	+ 1 51.9	+0.2859	0.5109	0.1906	+53	-21
B. A. C. 3903	6½	3 42	21.5	0 15.2	20 29.6	+ 1 56.6	-0.6179	0.5109	0.1906	+ 3	-79
B. A. C. 3909	6	3.40	21.5	0 12.3	21 13.4	+ 2 39.2	-0.8112	0.5109	0.1906	- 8	-90
B. A. C. 3955	5½	+3.37	-20.9	- 1 47.4	3 2 5.8	+ 7 23.5	+0.0148	0.5110	-0.1901	+37	-36
χ Virginis	5	3.15	17.6	7 21.0	4 10 44.6	- 8 53.2	+0.0948	0.5167	0.1800	+40	-31
B. A. C. 4259	6	3.15	17.6	7 23.3	10 49.2	- 8 48.8	+0.1225	0.5168	0.1800	+42	-30
28 Virginis	6	3.13	17.7	6 51.4	12 10.6	- 7 29.7	-0.7091	0.5172	0.1793	- 4	-90
ψ Virginis	5	3.11	16.6	8 54.2	18 41.6	- 1 10.0	+0.3940	0.5193	0.1757	+58	-15
g Virginis	6	+3.08	-15.6	-10 6.8	5 1 45.1	+ 5 41.1	+0.5046	0.5219	-0.1712	+65	- 9
50 Virginis	6	3.06	15.6	9 42.2	2 43.2	+ 6 37.6	-0.1126	0.5223	0.1705	+28	-43
58 Virginis	6	3.05	15.2	9 55.7	6 42.4	+10 29.7	-0.5391	0.5239	0.1676	+ 4	-72
α Virginis	1	3.03	14.8	10 33.0	10 40.4	- 9 39.3	-0.5141	0.5256	0.1646	+ 5	-70
i Virginis	5½	3.05	14.1	12 5.8	11 26.8	- 8 54.3	+1.0610	0.5260	0.1640	+78	+26
B. A. C. 4531	6	+3.03	-13.6	-12 36.8	15 29.8	- 4 58.6	+0.9692	0.5278	-0.1606	+78	+20
86 Virginis	6	2.98	13.2	11 50.3	21 11.6	+ 0 32.9	-0.7809	0.5305	0.1556	-12	-90
B. A. C. 4679	6½	2.99	11.5	14 24.4	6 6 24.1	+ 9 28.6	+0 6419	0.5354	0.1463	+72	- 1
α^1 Libræ	6	2.88	8.5	15 30.5	7 4 45.8	+ 7 7.8	-1.1353	0.5477	0.1190	-42	-90
α^2 Libræ –	2½	2.88	8.5	15 33.2	4 51.4	+ 7 13.2	-1.0980	0.5478	0.1188	-39	-90
B. A. C. 4896	6	+2.91	- 8.1	-17 18.1	5 9.3	+ 7 30.4	+0.7543	0.5479	-0.1184	+73	+ 6
26 Libræ	6½	2.87	6.6	17 19.7	15 54.6	- 6 5.3	-0.3991	0.5540	0.1028	+ 4	-62
28 Libræ	6	2.87	6.0	17 43.9	18 49.7	- 3 16.3	-0.2577	0.5556	0.0983	+11	-52
B. A. C. 5109	6½	2.90	4.9	19 16.1	8 0 10.2	+ 1 53.8	+0.8962	0.5585	0.0897	+71	+16
41 Libræ	6	2.87	4.6	18 54.8	3 2.1	+ 4 39.8	+0.2631	0.5601	0.0850	+38	-22
κ Libræ	5	+2.88	- 4.3	-19 17.8	4 24.7	+ 5 59.7	+0.5623	0.5608	-0.0827	+59	- 5
λ Libræ	6	2.88	3.4	19 48.9	9 31.8	+10 56.3	+0.7134	0.5635	0.0739	+70	+ 4
β^1 Scorpii	2	2.86	2 6	19 28.9	14 56.4	+ 7 50.3	-0.0166	0.5661	0.0643	+20	-38
β^2 Scorpii	5½	2.86	2.6	19 28.7	14 56.5	- 7 50.2	-0.0199	0.5661	0.0643	+20	-38
B. A. C. 5333	6½	2.86	2.6	19 21.5	15 4.9	- 7 42.1	-0.1578	0.5662	0.0640	+13	-46
				NEW	*MOON.*						
Yarnall 7918	6	+2.87	+ 9.5	-19 23.6	11 10 31.5	+ 9 18.5	+0.0954	0.5810	+0.0717	+27	-31
Yarnall 7941	6½	2.84	9.8	18 28.9	11 48.1	+10 32.3	-0.7590	0.5807	0.0743	-20	-90
Yarnall 7942	6	2.86	9.6	19 43.5	11 49.9	+10 34.0	+0.5367	0.5807	0.0762	+56	- 6
Yarnall 8035	6½	+2.87	+10.5	-19 18.2	16 44.6	- 8 42.1	+0.4872	0.5803	+0.0840	+53	- 9
Yarnall 8088	6	2.87	10.8	19 16.1	19 5.2	- 6 26.6	+0.6529	0.5800	0.0884	+66	+ 1
Yarnall 8122	6½	2.87	11.1	18 54.9	20 48.2	- 4 47.4	+0.4404	0.5797	0.0919	+50	-12
B. A. C. 6536	6	2.88	11.1	19 28.3	21 16.6	- 4 20.1	+1.0610	0.5797	0.0928	+71	+29
d Sagittarii	5	2.88	11.9	19 9.5	12 1 15.8	- 0 29.6	+1.1202	0.5790	0.1004	+71	+34
ρ^1 Sagittarii	4	+2.86	+12.3	-18 3.9	3 0.4	+ 1 11.1	+0.1651	0.5787	+0.1036	+34	-27
ρ^2 Sagittarii	5½	2.87	12.2	18 31.3	3 3.9	+ 1 14.5	+0.6451	0.5787	0.1037	+67	0
B. A. C. 6658	6	2.89	12.6	18 35.6	5 43.8	+ 3 48.6	+1.0000	0.5782	0.1086	+72	+24
e^1 Sagittarii	6	2.87	13.8	16 33.5	11 10.2	+ 9 3.2	-0.4857	0.5771	0.1183	0	-69
e^2 Sagittarii	5	2.88	13.9	16 23.7	11 56.7	+ 9 48.0	-0.5624	0.5769	0.1196	- 4	-76
B. A. C. 6746	6	+2.87	+14.1	-15 44.5	12 23.7	+10 14.0	-1.1833	0.5768	+0.1202	-48	-90
g Sagittarii	5½	2.91	14.9	15 47.9	18 35.5	- 7 47.6	-0.3436	0.5753	0.1308	+ 9	-58
B. A. C. 6992	6½	2.95	16.4	15 9.1	13 4 28.8	+ 1 44.5	+0.3624	0.5726	0.1465	+51	-17
β Capricorni	3	2.95	16.4	15 8.9	4 34.9	+ 1 50.4	+0.3738	0.5726	0.1466	+51	-16
Yarnall 8844	6½	2.95	16.9	13 46.2	5 57.3	+ 3 9.8	-0.8403	0.5722	0.1487	-17	-90
B. A. C. 7087	5	+2.97	+17.3	-14 7.3	10 20.6	+ 7 23.7	+0.1867	0.5710	+0.1550	+41	-26
B. A. C. 7221	6½	+3.00	+18.5	-12 58.5	17 35.6	- 9 36.6	+0.1702	0.5690	+0.1645	+41	-27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
B. A. C. 7242	6	+2.99	+18.9	-12 0.8	13 18 40.0	- 8 34.5	-0.6377	0.5688	+0.1659	- 3	-83
ν Aquarii	4½	3.04	19.7	11 50.6	14 1 57.2	- 1 32.6	+0.4290	0.5668	0.1746	+59	-13
14 Aquarii	6	3.03	20.4	9 42.1	4 57.9	+ 1 21.8	-1.2303	0.5660	0.1779	-45	-90
17 Aquarii	6½	3.07	20.7	9 48.9	7 54.9	+ 4 12.5	-0.5829	0.5658	0.1810	+ 2	-76
19 Aquarii	6	3.08	20.6	10 14.7	8 55.3	+ 5 10.9	+0.0380	0.5650	0.1821	+36	-34
ξ Aquarii	4½	+3.11	+21.6	- 8 22.6	14 32.3	+10 36.2	-0.8307	0.5635	+0.1874	-12	-90
B. A. C. 7562	6½	3.16	21.6	9 34.3	17 44.4	-10 18.3	+0.9931	0.5627	0.1901	+81	+21
c¹ Capricorni	5½	3.16	21.6	9 37.1	17 46.7	-10 16.1	+1.0466	0.5627	0.1901	+81	+25
30 Aquarii	5½	3.21	22.8	7 5.2	15 2 1.4	- 2 18.3	+0.0603	0.5611	0.1965	+39	-33
B. A. C. 7744	6	3.24	23.7	5 17.7	6 18.9	+ 1 50.4	-0.9131	0.5604	0 1992	-16	-90
44 Aquarii	5½	+3.26	+23.3	- 5 58.2	8 17.1	+ 3 44.5	+0.1661	0.5601	+0.2003	+45	-27
51 Aquarii	5½	3.29	23.7	5 25.6	11 27.5	+ 6 48.4	+0.2528	0.5597	0.2020	+51	-23
κ Aquarii	5	3.35	24.2	4 49.8	17 39.3	-11 12.5	+0.9057	0.5592	0.2048	+85	+14
B. A. C. 8152	6½	3.59	25.6	- 0 21.1	16 14 27.6	+ 8 53.4	+0.6719	0.5586	0.2086	+85	0
κ Piscium	4½	3.62	25.9	+ 0 37.0	16 0.6	+10 23.3	+0.0138	0.5586	0.2086	+37	-36
9 Piscium	6½	+3.62	+25.9	+ 0 28.9	16 9.3	+10 31.6	+0.1811	0.5587	+0.2086	+47	-27
15 Piscium	6½	3.65	25.9	0 40.1	19 53.6	- 9 51.7	+0.7705	0.5590	0.2082	+90	+ 6
16 Piscium	6	3.67	26.1	1 27.2	20 18.7	- 9 27.4	+0.0611	0.5590	0.2082	+40	-33
λ Piscium	5	3.70	26.0	1 8.3	22 52.5	- 6 58.9	+0.9147	0.5593	0.2078	+90	+15
19 Piscium	6	3.73	26.5	2 50.4	17 0 50.3	- 5 5.0	-0.4023	0.5595	0.2074	+15	-61
B. A. C. 8276	6½	+3.74	+25.9	+ 1 34.1	1 55.8	- 4 1.7	+1.1122	0.5596	+0.2072	+90	+30
22 Piscium	6½	3.76	26.2	2 16.9	3 21.2	- 2 39.3	+0.6837	0.5598	0.2069	+87	+ 1
45 Piscium	6	4.02	26.8	7 2.8	18 30.9	+11 59.2	-1.0493	0.5624	0.2004	-25	-83
51 Piscium	6½	4.05	26.2	6 18.6	21 30.4	- 9 7.5	+0.2923	0.5631	0.1987	+54	-19
δ Piscium	4½	4.17	25.6	6 57.0	18 4 44.5	- 2 8.5	+1.0654	0.5651	0.1937	+90	+28
B. A. C. 286	6½	+4.28	+25.3	+ 8 11.6	10 50.6	+ 3 44.8	+0.9718	0.5669	+0.1886	+90	+21
Yarnall 585	6½	4.34	25.3	9 17.1	13 24.7	+ 6 13.4	+0.3482	0.5678	0.1863	+58	-15
Yarnall 592	6½	4.34	25.2	9 6.5	13 39.7	+ 6 28.0	+0.5738	0.5679	0.1861	+75	- 3
B. A. C. 454	6	4.50	24.1	10 17.2	23 35.5	- 7 57.3	+1.1787	0.5712	0.1757	+90	+40
π Piscium	6	4.57	24.1	11 32.7	19 1 55.4	- 5 42.4	+0.3111	0.5721	0.1729	+55	-15
Yarnall 931	6½	+4.76	+22.4	+12 54.8	12 51.3	+ 4 49.9	+0.7406	0.5759	+0.1589	+90	+10
19 Arietis	6	4.87	21.9	14 43 9	17 17.2	+ 9 6.1	-0.4137	0.5774	0.1527	+14	-55
29 Arietis	6½	4.99	20.1	14 31.0	20 1 40.6	- 6 48.9	+1.0330	0.5805	0.1397	+90	+32
π Arietis	6	5.15	18.8	16 58.7	8 30.3	- 0 14.4	-0.5527	0.5830	0.1284	+ 6	-62
ρ² Arietis	6	5 20	18.3	17 15.4	11 12.4	+ 2 21.7	-1.1074	0.5838	0.1237	-23	-73
ρ³ Arietis	6	+5.22	+18.3	+17 33.4	11 27.4	+ 2 36.1	-0.7702	0.5839	+0.1231	- 7	-73
53 Arietis	6	5.28	16.9	17 25.7	16 2.1	+ 7 0.6	-0.0947	0.5855	0.1149	+31	-31
54 Arietis	6½	5.30	17.0	18 20.8	16 23.9	+ 7 21.5	-0.9870	0.5856	0.1141	-22	-72
B. A. C. 1096	6½	5.41	13.8	17 26.8	21 3 1.8	- 6 24.6	+1.0363	0.5883	0.0937	+90	+37
13 Tauri	6½	5.51	13.1	19 19.5	6 21.4	- 3 12.5	-0.5790	0.5891	0.0871	+ 4	-60
B. A. C. 1242	6½	+5.61	+10.8	+19 52.2	14 1.5	+ 4 10.1	-0.5296	0.5905	+0.0713	+ 7	-55
A² Tauri	6	5.66	10.5	20 41.5	15 42.1	+ 5 46.9	-1.2543	0.5907	0.0679	-55	-70
ω¹ Tauri	6	5.62	9.6	19 17.9	17 18.7	+ 7 19.8	+0.2775	0.5909	0.0644	+54	- 6
ω² Tauri	5½	5.69	8.7	20 17.4	20 35.9	+10 29.5	-0.5367	0.5913	0.0574	+ 6	-55
53 Tauri	6	5 73	8.6	20 51.5	21 28.1	+11 19.7	-1.0705	0.5914	0.0556	-31	-69
B. A. C. 1361	6½	+5.66	+ 7.6	+18 46.3	23 44.9	-10 28.8	+1.1885	0.5914	+0.0506	+90	+55
ε Tauri	3½	5·68	7.0	18 55.2	22 1 14.2	- 9 2.8	+1.1115	0.5914	0.0473	+90	+48
ι Tauri	5	5.88	2.5	21 25.2	15 13.9	+ 4 24.9	-1.0125	0.5908	0.0167	-26	-69
B. A. C. 1563	6½	5.82	2.0	19 38.6	16 16.1	+ 5 24.7	+0.8362	0.5907	0.0142	+90	+31
l Tauri	5½	5.84	1.7	20 15.7	17 11.2	+ 6 17.8	+0.2099	0.5905	0.0122	+50	- 5
105 Tauri	6	+5.89	+ 1.8	+21 32.9	17 12 3	+ 6 18.8	-1.1153	0.5905	+0.0122	-37	-69
B. A. C. 1651	6½	5.84	- 0.2	19 41.5	22 34.4	+11 28.7	+0.8341	0.5900	+0 0004	+90	+32
B. A. C. 1733	6½	5.89	2.0	20 23.2	23 3 46.4	- 7 31.1	+0.0892	0.5887	-0.0109	+42	-11
ζ Tauri	3½	5.91	2.6	21 4.1	5 24.5	- 5 56.8	-0.6374	0.5883	0.0145	0	-59
B. A. C. 1835	6½	5.91	4.0	20 49.5	9 50.8	- 1 40.4	-0.4711	0.5872	0.0240	+10	-47
B. A. C. 1867	6½	+5.89	- 4.7	+20 16.1	11 54 7	+ 0 18.8	+0.0519	0.5863	-0.0283	+40	-15
χ¹ Orionis	4½	+5.89	- 4.9	+20 15.1	12 21.9	+ 0 45.0	+0.0566	0.5862	-0.0293	+40	-15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1882.0. Δα	Red'ns from 1882.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
χ^2 Orionis	6	+5.87	- 5.0	+19 43.5	23 12 35.9	+ 0 58.4	+0.5974	0.5861	-0.0298	+81	+15
χ^3 Orionis	5	5.86	6.1	19 41.4	16 8.6	+ 4 23.2	+0.5157	0.5848	0.0372	+72	+ 9
χ^4 Orionis	5	5.88	6.3	20 8.3	16 19.6	+ 4 33.8	+0.0422	0.5847	0.0377	+39	-16
68 Orionis	6	5.86	7.4	19 48.8	19 43.6	+ 7 50.3	+0.2408	0.5833	0.0447	+51	- 6
71 Orionis	5½	5.84	7.8	19 11.6	20 55.9	+ 8 59.9	+0.8322	0.5829	0.0471	+90	+27
15 Geminorum	6	+5.90	- 9.6	+20 51.5	24 2 20.9	- 9 47.1	-1.1910	0.5805	-0.0581	-44	-69
16 Geminorum	6	5.89	9.6	20 33.8	2 25 5	- 9 42.7	-0.8866	0.5805	0.0582	-16	-70
ν Geminorum	4½	5.88	9.8	20 16.9	2 51.7	- 9 17.5	-0.6200	0.5803	0.0591	+ 1	-61
B. A. C. 2432	6½	5.69	16.8	18 29 6	25 2 20.6	-10 38.9	-0.6525	0.5676	0.1022	0	-67
Lalande 14620	6	5.63	17.7	17 19.3	6 14.9	- 6 52.7	+0.1744	0.5653	0.1085	+47	-16
f Geminorum	6	+5.63	-18.8	+17 56.2	9 40.7	- 3 34.1	-0.8582	0.5632	-0.1138	-13	-72
1 Cancri	6	5.51	20.3	16 5.9	17 40.4	+ 4 9.3	+0.1348	0.5583	0.1256	+45	-20
5 Cancri	6	5.52	21.0	16 46.4	19 43.8	+ 6 8.6	-0.8453	0.5571	0.1286	-12	-74
Yarnall 3294	6½	5.43	21.3	14 41.2	22 48.0	+ 9 6.7	+0.9783	0.5552	0.1327	+90	+28
29 Cancri	6	5.36	23.4	14 35.6	26 8 25.9	- 5 34.5	-0.2583	0.5491	0.1448	+22	-45
B. A. C. 2872	6½	+5.31	-23.7	+13 39.3	10 53.0	- 3 12.0	+0.3912	0.5475	-0.1476	+61	- 9
A¹ Cancri	6	5.26	24.5	13 5.8	15 24.9	+ 1 11.0	+0.3109	0.5447	0.1526	+55	-14
A² Cancri	6	5.23	24.6	12 32.1	17 13.5	+ 2 56.1	+0.6365	0.5436	0.1545	+83	+ 4
60 Cancri	6	5.18	25.3	12 4.1	21 35.4	+ 7 9.7	+0.4559	0.5410	0.1588	+66	- 7
α Cancri	4	5.18	25.6	12 18.4	22 49.9	+ 8 21.9	+0.0024	0.5403	0.1600	+37	-31
κ Cancri	5	+5.10	-26.0	+11 8.1	27 3 23.8	-11 12.7	+0.5277	0.5377	-0.1641	+72	- 4
B. A. C. 3122	6½	5.11	26.4	12 2.2	4 23.0	-10 15.4	-0.6123	0.5371	0.1650	+ 3	-72
ω Leonis	6	4.97	27.0	9 33.7	13 43.7	- 1 11.9	+0.4938	0.5320	0.1724	+69	- 7
h Leonis	6	4.96	27.3	10 13.7	15 29.3	+ 0 30.5	-0.5329	0.5311	0.1736	+ 7	-67
π Leonis	5	4.81	28.4	8 36.1	28 5 56.9	- 9 28.0	-1.3409	0.5242	0.1820	-63	-82
14 Sextantis	6	+4.74	-28.1	+ 6 10.7	9 23.2	- 6 7.7	+0.6774	0.5227	-0.1835	+86	+ 2
16 Sextantis	6	4.73	28.2	6 44.4	10 39.3	- 4 53.8	-0.1704	0.5222	0.1841	+27	-45
19 Sextantis	6½	4.70	28.1	5 11.4	12 31.8	- 3 4.6	+1.1814	0.5215	0.1849	+90	+37
Yarnall 4339	6½	4.63	28.2	4 31.5	19 42.2	+ 3 53.3	+0.5759	0.5190	0.1874	+77	- 5
34 Sextantis	6	4.54	28.4	4 11.5	29 4 15.2	-11 48.5	-0.6697	0.5164	0.1895	0	-83
36 Sextantis	6	+4.52	-28.2	+ 3 6.0	5 36.2	-10 29.8	+0.2730	0.5160	-0.1898	+53	-21
B. A. C. 3726	6	4.49	27.8	1 38.6	9 22.7	- 6 49.7	+1.1588	0.5150	0.1904	+90	+34
55 Leonis	6	4.47	27.9	1 21.5	11 13.9	- 5 1.7	+1.1205	0.5147	0.1906	+90	+31
p^2 Leonis	6	4.43	27.5	0 37.6	15 28.6	- 0 54.2	+1.1169	0.5139	0.1911	+90	+30
p^5 Leonis	5	4.38	27.7	+ 0 33.9	20 55.6	+ 4 23.5	+0.1450	0.5130	0.1912	+45	-28
B. A. C. 3901	6	+4.31	-27.1	- 1 3.5	30 4 32.6	+11 47.6	+0.4810	0.5121	-0.1909	+67	-11
B. A. C. 3903	6½	4.31	27.4	0 15.3	4 37.5	+11 52.3	-0.4206	0.5121	0.1908	+14	-62
B. A. C. 3909	6	4.29	27.4	0 12.4	5 21.1	-11 25.3	-0.6137	0.5121	0.1908	+ 3	-79
B. A. C. 3955	5½	4.26	26 7	1 47.5	10 12.4	- 6 42.2	+0.2115	0.5118	0.1902	+49	-25
χ Virginis	5	4.04	23.3	7 21.1	31 18 52.8	+ 1 2.7	+0.2906	0.5150	0.1796	+53	-22
B. A. C. 4259	6	+4.05	-23.3	- 7 23.4	18 57.4	+ 1 7.2	+0.3183	0.5150	-0.1796	+55	-20
28 Virginis	6	+4.03	-23.5	- 6 51.5	20 19.3	+ 2 26.8	-0.5148	0.5153	-0.1789	+ 8	-71

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1882.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington		Angle from		Washington		Angle from		
	Name.	Mag	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 1	105 Tauri	6	7 5	12 18	150	100	7 52	13 5	221	167	0 47
4	*f* Geminorum	6	2 41	7 42	72	126	3 47	8 48	303	357	1 6
4	1 Cancri *	6	16 46	19 46	198	149	Star 1′.1	south of	☽'s	limb.	
5	29 Cancri	6	3 17	8 15	145	199	4 10	9 7	241	294	0 53
5	A^1 Cancri	6	13 40	18 37	148	95	14 30	19 26	257	205	0 50
7	14 Sextantis	6	7 55	12 44	162	198	8 57	13 46	256	278	1 3
7	19 Sextantis	6½	13 19	18 8	184	139	13 52	18 41	235	187	0 33
8	B. A. C. 3726	6	8 50	13 35	163	195	9 56	14 41	262	278	1 6
8	55 Leonis	6	11 19	16 4	104	95	12 42	17 27	322	291	1 23
10	B. A. C. 4201	6½	13 38	18 15	116	96	15 3	19 39	299	263	1 25
	NEW MOON.										
21	51 Aquarii ‡	5½	3 36	7 32	61	11	4 30	8 25	252	201	0 54
26	54 Arietis ‡	6½	9 52	13 27	97	47	10 43	14 17	253	208	0 51
30	ν Geminorum	4½	1 41	5 0	180	236	Star 3′.7	south of	☽'s	limb.	
31	B. A. C. 2432	6½	3 3	6 18	136	191	4 3	7 19	239	292	1 0
Feb. 1	29 Cancri	6	14 33	17 43	20	328	Star 0′.8	north of	☽'s	limb.	
5	ϵ Leonis	4½	15 44	18 38	141	93	16 43	19 37	265	215	0 59
7	B. A. C. 4312	6½	8 27	11 14	147	193	9 29	12 16	269	309	1 2
15	B. A. C. 7063	6	15 49	18 3	347	34	Star 1′.7	north of	☽'s	limb.	
	NEW MOON.										
23	13 Tauri	6½	9 35	11 19	157	104	9 55	11 39	199	148	0 20
25	ζ Tauri ‡	3½	12 3	13 39	86	35	12 55	14 31	290	243	0 52
26	16 Geminorum	6	11 24	12 56	15	320	Star 2′.9	north of	☽'s	limb.	
26	ν Geminorum	4½	11 34	13 7	77	22	12 27	14 0	211	258	0 53
Mar. 1	60 Cancri	6	12 31	13 51	187	136	12 54	14 14	225	173	0 23
1	α Cancri	4	13 43	15 3	31	338	13 51	15 11	16	323	0 8
3	Yarnall 4339	6½	11 38	12 51	82	57	12 42	13 54	341	303	1 4
8	B. A. C. 4700 *	5½	7 54	8 47	164	217	8 29	9 22	238	289	0 35
9	ι^1 Libræ	4½	13 13	14 1	102	126	14 41	15 29	297	303	1 28
9	ι^2 Libræ	6	14 31	15 19	18	26	Star 0′.8	north of	☽'s	limb.	
15	8 Aquarii †	6	15 1	15 25	86	138	15 59	16 23	246	294	0 57
	NEW MOON.										
21	19 Arietis	6	6 22	6 25	125	71	7 5	7 8	211	157	0 43
23	ω^2 Tauri ‡	5½	10 31	10 25	80	28	11 23	11 17	282	234	0 52
27	1 Cancri ‡	6	14 27	14 4	86	36	15 16	14 53	308	261	0 49
28	A^1 Cancri	6	13 54	13 27	86	33	14 47	14 21	316	265	0 54
29	ω Leonis	6	13 32	13 2	80	29	14 26	13 56	330	278	0 54
30	14 Sextantis	6	8 27	7 53	153	183	9 42	9 9	268	274	1 16
30	19 Sextantis	6½	13 50	13 16	182	135	14 20	13 46	233	184	0 30
31	B. A. C. 3726	6	9 57	9 19	212	227	Star 0′.9	south of	☽'s	limb.	
31	55 Leonis	6	11 53	11 15	131	112	13 16	12 38	292	255	1 23
Apr. 4	B. A. C. 4700	5½	17 45	16 51	72	30	18 46	17 51	312	265	1 1
6	B. A. C. 5278	6	18 16	17 14	136	106	19 13	18 11	229	190	0 57
6	B. A. C. 5281	6	19 10	18 8	2	324	Star 4′.6	north of	☽'s	limb.	
8	58 Ophiuchi	5	14 11	13 1	4	42	Star 5′.2	north of	☽'s	limb.	
8	B. A. C. 5992	6½	14 15	13 5	128	157	15 18	14 8	239	277	1 3
9	B. A. C. 6347 *	6½	13 13	12 0	180	231	Star 3′.9	south of	☽'s	limb.	
9	Yarnall 7955	6	18 16	17 2	349	354	Star 0′.1	north of	☽'s	limb	
14	9 Piscium	6½	17 51	16 17	338	29	Star 2′.4	north of	☽'s	limb.	
	NEW MOON.										
23	Lalande 14620	6	11 39	9 31	108	54	12 42	10 34	291	237	1 4
25	κ Cancri	5	11 18	9 2	106	64	12 33	10 17	309	259	1 15
28	ϵ Leonis ‡	4½	16 54	14 26	133	28	17 50	15 21	268	217	0 55
30	B. A. C. 4312	6½	9 45	7 10	208	246	Star 0′.4	south of	☽'s	limb.	
May 7	B. A. C. 6658	6	18 15	15 11	346	1	Star 4′.0	north of	☽'s	limb.	

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1882.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington		Angle from		Washington		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
	NEW MOON.										
May 22	A^2 Cancri	6	10 37	6 35	149	110	11 45	7 43	265	216	1 8
22	60 Cancri *	6	15 58	11 56	19	331	Star 3′.4	north of	☽'s	limb.	
25	p^2 Leonis	6	10 15	6 1	113	126	11 43	7 29	313	299	1 28
30	ι^1 Libræ	4½	15 47	11 13	117	107	17 10	12 36	268	241	1 23
30	ι^2 Libræ	6	16 31	11 56	70	51	17 43	13 9	310	278	1 12
June 2	Yarnall 7631	6½	16 31	11 45	41	60	17 30	12 44	310	317	0 59
2	μ Sagittarii	4	21 3	16 16	347	313	Star 1′.6	north of	☽'s	limb.	
2	14 Sagittarii	6	20 57	16 10	166	133	Star 5′.8	south of	☽'s	limb.	
3	B. A. C. 6536	6	18 8	13 17	348	0	Star 4′.8	north of	☽'s	limb.	
10	π Piscium	6	20 29	15 10	157	209	Star 3′.6	south of	☽'s	limb.	
	NEW MOON.										
18	B. A. C. 2872	6½	14 33	8 45	62	10	15 10	9 22	338	288	0 37
21	B. A. C. 3726	6	15 26	9 25	81	32	16 20	10 20	325	274	0 54
29	B. A. C. 5954	6	15 30	8 58	52	77	16 33	10 1	310	329	1 3
29	58 Ophiuchi	5	18 57	12 24	353	336	Star 3′.0	north of	☽'s	limb.	
30	B. A. C. 6347	6½	15 37	9 0	160	194	15 57	9 21	192	223	0 20
July 3	B. A. C. 7562	6½	21 0	14 12	94	104	22 6	15 17	208	201	1 5
3	c^1 Capricorni	5½	21 6	14 17	108	116	21 59	15 10	194	189	0 53
4	κ Aquarii	5	19 24	12 31	99	139	20 22	13 29	207	239	0 58
5	16 Piscium	6	22 43	15 46	12	357	23 37	16 40	288	286	0 54
	NEW MOON.										
21	B. A. C. 4312	6½	17 11	9 12	150	103	18 1	10 2	246	196	0 50
25	B. A. C. 5395	6	16 22	8 7	75	72	17 43	9 28	295	274	1 21
28	B. A. C. 6536	6	15 14	6 48	355	37	Star 3′.9	north of	☽'s	limb.	
28	*d* Sagittarii	5	20 11	11 44	24	11	21 3	12 36	300	276	0 52
31	51 Aquarii	5½	1 57	17 17	16	333	2 38	17 58	292	245	0 41
Aug. 3	Yarnall 585	6½	23 11	14 19	98	134	0 13	15 22	206	224	1 3
10	Lalande 14620 *	6	23 5	13 46	110	151	23 54	14 36	260	306	0 49
	NEW MOON.										
18	i Virginis	5½	19 30	9 41	86	47	20 40	10 51	308	262	1 10
24	Yarnall 7955	6	19 55	9 42	94	78	21 7	10 54	234	204	1 12
24	29 Sagittarii	6	21 16	11 3	149	117	21 35	11 22	179	145	0 19
27	B. A. C. 7562	6½	19 41	9 16	53	81	20 54	10 29	255	266	1 14
27	c^1 Capricorni	5½	19 40	9 15	63	91	20 55	10 30	245	256	1 15
27	c^2 Capricorni	6½	20 42	10 17	153	168	Star 1′.7	south of	☽'s	limb.	
28	κ Aquarii	5	17 13	6 44	42	92	18 5	7 37	276	323	0 53
29	15 Piscium	6½	17 34	7 2	38	89	18 22	7 49	278	328	0 47
29	λ Piscium	5	20 33	10 0	88	130	21 36	11 3	216	248	1 3
29	22 Piscium	6½	2 58	16 24	155	112	Star 2′.4	south of	☽'s	limb.	
31	π Piscium	6	21 10	10 29	18	71	21 52	11 11	294	345	0 42
Sept. 4	B. A. C. 1733	6½	0 34	13 37	81	137	1 42	14 45	265	321	1 8
8	α Cancri *	4	1 33	14 20	28	76	1 49	14 36	354	43	0 16
10	Yarnall 4339	6½	0 31	13 10	159	201	1 34	14 13	255	287	1 3
	NEW MOON.										
18	ω Ophiuchi	5	20 47	8 55	177	132	Star 0′.3	south of	☽'s	limb.	
20	21 Sagittarii	5	21 14	9 15	77	43	22 23	10 24	255	212	1 9
21	*d* Sagittarii	5	18 2	5 59	94	109	19 22	7 19	238	235	1 20
21	ρ^2 Sagittarii	5½	21 16	9 13	12	346	21 55	9 52	310	277	0 39
21	B. A. C. 6658 *	6	0 28	12 25	162	113	Star 3′.0	south of	☽'s	limb.	
24	51 Aquarii	5½	2 53	14 37	31	343	3 40	15 24	283	233	0 46
25	B. A. C. 8152	6½	4 5	15 45	145	95	Star 0′.8	south of	☽'s	limb.	
25	κ Piscium *	4½	5 56	17 36	341	290	Star 1′.5	north of	☽'s	limb.	
25	9 Piscium *	6½	5 37	17 17	38	347	6 20	17 59	282	232	0 42

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OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1882.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington		Angle from		Washington		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Sept. 27	B. A. C. 286	6½	18 31	6 4	96	147	19 18	6 51	222	274	0 47
27	Yarnall 585	6½	21 59	9 32	334	20	Star 0′.9	north of	☽'s	limb.	
27	Yarnall 592	6½	21 34	9 7	49	97	22 39	10 12	259	300	1 5
28	Yarnall 931 †	6½	19 11	6 40	68	118	20 2	7 31	254	306	0 51
30	ω^1 Tauri	6	22 44	10 5	26	80	23 23	10 44	306	1	0 39
Oct. 1	B. A. C. 1563	6½	22 11	9 27	172	223	Star 2′.4	south of	☽'s	limb.	
2	χ^3 Orionis †	5	22 30	9 43	88	135	23 23	10 36	266	317	0 53
2	68 Orionis	6	2 22	13 35	83	139	3 39	14 51	275	327	1 17
4	1 Cancri	6	2 34	13 39	52	106	3 21	14 25	324	18	0 47
5	A^1 Cancri †	6	1 25	12 25	75	123	2 16	13 17	305	356	0 52
5	A^2 Cancri	6	3 57	14 57	193	246	Star 0′.5	south of	☽'s	limb.	
	NEW MOON.										
16	B. A. C. 5758	6	18 3	4 22	117	103	19 17	5 35	237	209	1 13
18	Yarnall 8035	6½	18 58	5 9	347	346	Star 3′.9	north of	☽'s	limb.	
18	Yarnall 8088	6	21 38	7 49	72	39	22 48	8 59	252	210	1 10
18	Yarnall 8122 ‡	6½	23 51	10 1	61	13	0 47	10 58	267	215	0 57
21	B. A. C. 7562	6½	18 30	4 29	99	137	19 33	5 32	216	244	1 4
21	c^1 Capricorni	5½	18 35	4 34	113	151	19 27	5 26	201	231	0 52
23	15 Piscium	6½	18 35	4 26	55	105	19 35	5 26	257	304	1 0
23	λ Piscium	5	22 19	8 10	134	156	22 40	8 31	166	182	0 21
23	B. A. C. 8276	6½	0 41	10 31	154	200	Star 1′.4	south of	☽'s	limb.	
25	π Piscium	6	22 38	8 20	340	27	22 42	8 25	330	17	0 5
26	29 Arietis	6½	20 30	6 9	162	214	Star 0′.0	south of	☽'s	limb.	
27	B. A. C. 1096	6½	20 56	6 31	166	217	Star 1′.8	south of	☽'s	limb.	
29	χ^2 Orionis	6	7 45	17 11	137	91	8 47	18 12	243	189	1 1
Nov. 1	B. A. C. 2872	6½	6 28	15 42	90	131	7 51	17 5	314	330	1 23
3	14 Sextantis	6	6 9	15 15	140	189	7 21	16 27	268	310	1 12
7	g Virginis †	6	7 13	16 2	131	182	8 12	17 2	275	323	0 59
	NEW MOON.										
14	Yarnall 7942	6	21 30	5 55	57	23	22 37	7 2	271	228	1 7
18	51 Aquarii	5½	22 17	6 25	331	331	Star 3′.0	north of	☽'s	limb.	
19	B. A. C. 8152	6½	1 16	9 20	152	130	Star 0′.1	south of	☽'s	limb.	
21	Yarnall 585	6½	21 51	5 48	349	36	22 9	6 5	319	4	0 17
21	Yarnall 592	6½	21 32	5 29	54	102	22 40	6 37	254	295	1 8
24	ω^1 Tauri	6	23 28	7 13	356	51	23 40	7 24	336	31	0 11
25	B. A. C. 1563 †	6½	21 27	5 8	115	161	22 10	5 50	231	281	0 42
26	68 Orionis	6	1 3	8 39	23	78	1 30	9 6	333	29	0 27
29	60 Cancri	6	3 10	10 34	98	150	4 15	11 39	290	343	1 6
29	κ Cancri	5	9 32	16 55	39	355	9 50	17 13	13	327	0 18
Dec. 4	ψ Virginis	5	10 8	17 11	79	114	11 12	18 15	341	4	1 4
	NEW MOON.										
15	44 Aquarii	5½	3 4	9 26	24	335	3 46	10 8	290	239	0 42
18	Yarnall 585 *	6½	8 10	14 19	61	12	8 57	15 6	273	229	0 47
18	Yarnall 592 *	6½	8 21	14 30	105	57	9 4	15 13	229	186	0 43
19	Yarnall 931	6½	8 1	14 6	169	117	Star 3′.5	south of	☽'s	limb.	
22	B. A. C. 1563	6½	11 27	17 20	147	96	11 59	17 51	223	174	0 31
23	B. A. C. 1867	6½	6 6	11 56	13	1	6 16	12 6	359	342	0 10
23	χ^1 Orionis	4½	6 51	12 40	7	335	Star 0′.8	north of	☽'s	limb.	
23	χ^2 Orionis	6	7 1	12 50	157	122	7 42	13 32	219	173	0 41
23	χ^3 Orionis	5	11 11	17 0	79	24	12 4	17 53	301	248	0 53
26	B. A. C. 2872	6½	3 21	8 59	112	165	4 34	10 12	272	324	1 13
26	A^1 Cancri	6	9 48	15 25	62	34	10 36	16 13	350	310	0 48
26	A^2 Cancri	6	12 18	17 54	94	43	13 20	18 57	312	259	1 2
27	ω Leonis	6	6 56	12 29	137	179	8 16	13 49	273	297	1 20

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.

* Whole occultation below the horizon of Washington.

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‡ Emersion below the horizon of Washington.

FOR WASHINGTON MEAN NOON.

Date.		*k*	*i*	*θ*	*L*	Date.		*k*	*i*	*θ*	*L*
Jan.	1	0 996	7°.2	148°.1	25.1	July	0	0.014	166°.5	131°.0	2.3
	6	0.999	4.2	85.4	26.8		5	0.060	151.8	157.9	9.4
	11	0.995	8.5	22.6	29.9		10	0.144	135.4	166.5	20.2
	16	0.979	16.6	4.3	35.0		15	0.259	118.8	172.1	32.1
	21	0.945	27.0	354.6	42.6		20	0.402	101.2	177.3	44.5
	26	0.878	40.6	347.5	53.1		25	0.566	82.3	183 0	56.1
	31	0.758	58.8	342.2	63.9		30	0.741	61.2	189.5	65.9
Feb.	5	0.575	81.3	337.4	69.6	Aug.	4	0.885	39.5	197.9	68.1
	10	0.343	108.4	332.6	57.0		9	0.973	19.3	211.1	62.4
	15	0.122	137.8	324.6	26.9		14	0.998	5.2	275.3	52.3
	20	0.019	165.4	292.8	3.8		19	0.985	14.1	2.7	43.3
	25	0.033	159.2	185.9	6.1		24	0.955	24.5	14.2	36.5
Mar.	2	0.134	137.0	168.8	21.1		29	0.919	33.4	19.3	32.1
	7	0.258	118.9	164.3	30.8	Sept.	3	0.878	40.9	22.3	29.5
	12	0.371	104.9	161.0	33.8		8	0.836	47.7	24.2	28.3
	17	0.468	93 7	158.3	33.6		13	0.791	54.4	25.2	28.2
	22	0.548	84.4	156.0	32.4		18	0.740	61.3	25.9	29.4
	27	0.618	76.4	153.8	31.6		23	0.679	69.0	26.2	31.4
April	1	0.670	68.9	152.1	31 5		28	0.604	78.1	26.4	34.3
	6	0.739	61.5	150.7	32.3	Oct.	3	0.505	89.5	26.6	37.7
	11	0.798	53.6	149.8	34.7		8	0.377	104.3	27.2	38.7
	16	0.858	44.4	149.3	38.5		13	0.203	126.3	28.9	29.9
	21	0.918	33.2	149.2	44.7		18	0.066	150.1	34.0	13.5
	26	0.971	19.4	149.9	53.4		23	0.002	175.0	156.2	0.5
May	1	0.998	2.9	151.0	62·4		28	0.111	140.8	205.7	23.8
	6	0.976	17.7	338.0	68.2	Nov.	2	0.343	109.2	206.2	54.4
	11	0.892	38.5	341.2	66.9		7	0.561	83.0	207.6	59.8
	16	0.766	58.0	345.2	59.7		12	0.742	61.3	206.6	53.8
	21	0.632	74.8	349.5	50.8		17	0.847	46.1	204.5	43.7
	26	0.506	89.3	353.6	42.9		22	0.913	34.2	201.7	36.1
	31	0.394	102.2	357.4	36.5		27	0.952	25.2	197.6	30.6
June	5	0.293	114.6	1.0	30.5	Dec.	2	0.977	17.7	192.0	27.1
	10	0.204	127.0	4.7	24.0		7	0.990	11.3	183.2	25.2
	15	0.117	140.2	9.3	16.1		12	0.997	5.8	162.9	24.3
	20	0.049	154.3	18.2	7.7		17	0.999	3.2	82.7	24.7
	25	0.012	167.8	47.8	1.9		22	0.996	7.8	27.6	26.1
	30	0.014	166.5	131.0	2.3		27	0.984	14.5	13.2	28.8
							32	0.962	22.5	4.8	33.5

NOTATION.

k, the ratio of the illuminated portion of the apparent disk to the entire apparent disk considered as the superficies of a circle.

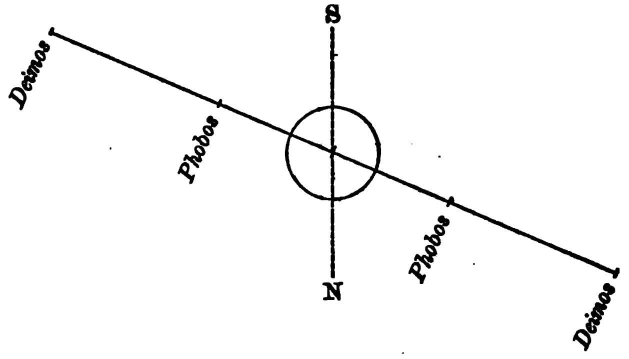
i, the angle between the sun and the earth, as seen from the planet.

θ, the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L, the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

Date.	*k*	*i*	*θ*	*L*	Date.	*k*	*i*	*θ*	*L*
Jan. 1	0.979	16°.4	180°.7	49.5	Aug. 14	0.676	69°.4	23°.3	92.4
6	0.983	14.7	177.1	49.0	19	0.657	71.6	23.4	96.8
11	0.987	13.1	173.1	48.5	24	0.638	73.9	23.4	101.7
16	0.990	11.5	168.8	48.1	29	0.618	76.3	23.2	107.0
21	0.992	10.0	164.4	47.7	Sept. 3	0.598	78.7	22.8	113.0
26	0.995	8.3	159.5	47.4	8	0.576	81.2	22.2	119.4
31	0.996	6.8	153.5	47.2	13	0.554	83.8	21.5	126.5
Feb. 5	0.998	5 2	146.5	47.0	18	0.530	86.5	20.7	134.3
10	0.999	3.9	135.1	46.9	23	0.506	89.3	19.7	143.0
15	0.999	2.6	113.8	46.8	28	0.480	92.2	18.6	152.2
20	1.000	1 8	71.8	46.8	Oct. 3	0.452	95.3	17.4	162.1
25	1.000	2.4	29.1	46.8	8	0.424	98.7	16·2	172.6
Mar. 2	0.999	3.7	8.4	46.8	13	0.393	102.4	15.0	183.2
7	0.998	5.3	357.9	46.9	18	0.360	106.3	13.8	193.7
12	0.996	6.9	351.4	47.1	23	0.325	110.5	12.8	203.2
17	0.995	8.6	348.3	47.3	28	0.286	115.3	11.9	210.2
22	0.992	10.3	346.0	47.6	Nov. 2	0.245	120.6	11.30	211.4
27	0.989	12.1	344.4	47.9	4	0.228	123.0	11.10	210.0
April 1	0.986	13.9	343.5	48.2	6	0.210	125.5	11.00	207.2
6	0.982	15.6	343.0	48.6	8	0.192	128.1	10.97	202.6
11	0.977	17.4	343.0	49.1	10	0.174	130.8	10.96	196.0
16	0.972	19.3	343.4	49.6	12	0.155	133.6	11.05	186.9
21	0.967	21.2	344.1	50.2	14	0.137	136 6	11.20	175.9
26	0.960	23.1	345.2	50.9	16	0.118	139.8	11.42	162.1
May 1	0.954	25.0	346.6	51.6	18	0.100	143.7	11.71	146.0
6	0.946	27.0	348.3	52.3	20	0.082	146.7	12.12	127.5
11	0.937	29.0	350 2	53.1	22	0.066	150.3	12.58	107.2
16	0.929	31.0	352.2	54.0	24	0.050	154.2	13.13	85.9
21	0.920	33.0	354.5	55.0	26	0.036	158.2	13.75	64.6
26	0.910	35.0	357.0	56.1	28	0.023	162.3	14.41	44.3
31	0.899	37.1	359.5	57.2	30	0.014	166.6	15.25	26.1
June 5	0.888	39.2	1.9	58.4	Dec. 2	0.006	171.0	16.27	12.0
10	0.877	41.2	4.4	59.8	4	0.002	175.6	19.70	3.2
15	0.864	43.3	6.8	61.3	6	0.000	180.0	46.15	0.0
20	0.851	45.5	9.2	62.9	8	0.001	176.0	193.11	2.5
25	0.837	47.6	11.3	64.6	10	0.006	171.1	195.06	12.0
30	0.823	49.7	13.3	66.4	12	0.014	166.7	195.82	26.1
July 5	0.809	51.8	15.3	68.4	14	0.024	162.4	196.42	44.9
10	0.794	54.0	16.9	70.5	16	0.036	158.2	196.74	64.9
15	0.779	56.1	18.4	72.9	18	0.050	154.2	196.95	86.8
20	0.763	58.3	19.7	75.5	20	0.066	150.2	197.10	109.0
25	0.747	60.4	20.8	78.3	22	0.083	146.5	197.09	130.3
30	0.730	62.6	21.8	81.3	24	0.101	143.0	197.03	149.1
Aug. 4	0.713	64.8	22.4	84.7	26	0.119	139.7	196.87	165.7
9	0.695	67.1	23.0	88.4	28	0.138	136.5	196.65	180.0
14	0.676	69.4	23.3	92.4	30	0.156	133.4	196.33	191.8
					32	0.175	130.5	196.03	201.1



APPARENT ORBITS OF THE SATELLITES OF MARS IN DECEMBER, 1881, AND JANUARY, 1882, AS SEEN IN AN INVERTING TELESCOPE.

The circle represents the disk of the planet. The orbits are seen edgewise, and therefore appear as a straight line. The points marked with the name of a satellite are those at which the satellite will be seen when at its greatest elongation.

The mean motions of the satellites are not yet (July, 1879) sufficiently established to enable the times of greatest elongation to be accurately predicted. When one elongation is observed during the opposition, the others in the same direction may be derived from it by adding multiples of the periodic times from the following table.

	d	h	m
Phobos, periodic time	0	7	39.25
Deimos, periodic time	1	6	17.90

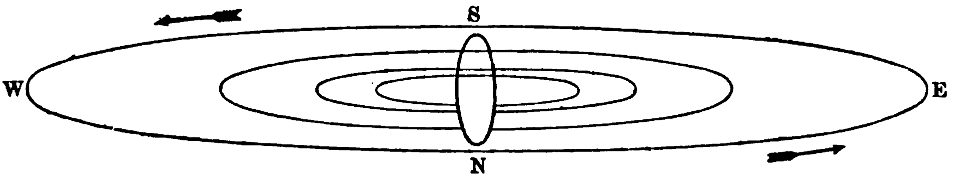
MULTIPLES OF PERIODIC TIMES OF SATELLITES OF MARS.

Periods.	Phobos.		Deimos.		Periods.	Phobos.		Deimos.	
	d	h	d	h		d	h	d	h
1	0	7.65	1	6.30	10	3	4.54	12	14.98
2	0	15.31	2	12.60	20	6	9.08	25	5.97
3	0	22.96	3	18.89	30	9	13.63	37	20.95
4	1	6.62	5	1.19	40	12	18.17	50	11.93
5	1	14.27	6	7.49	50	15	22.71	63	2.92
6	1	21.93	7	13.79	60	19	3.25	75	17.90
7	2	5.58	8	20.09	70	22	7.79	88	8.88
8	2	13.23	10	2.39	80	25	12.34	100	23.86
9	2	20.89	11	8.68	90	28	16.88	113	14.85
10	3	4.54	12	14.98	100	31	21.42	126	5.83

THE APPARENT DISK OF MARS.

1882.		April 30	0.905	September 27	0.986
January 1	0.998	May 30	0.920	October 27	0.995
January 31	0.953	June 29	0.938	November 26	1.000
March 1	0.911	July 29	0.957	December 26	0.999
March 31	0.899	August 28	0.973	December 56	0.994

The numbers which represent the apparent disk are the versed sines of the illuminated portion divided by the apparent diameter, or the ratio of the apparent illuminated disk to the entire disk.



APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1882, AS SEEN IN AN INVERTING TELESCOPE.

(*The vertical scale is three times the horizontal one.*)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose: reference to the above diagram enables one to identify the inner and outer satellite of the pair. The central ellipse represents the disk of Jupiter, elongated three times in the vertical direction to correspond to the representation of the orbits of the satellites.

Facing each page of the phenomena of Jupiter's satellites, pages 456—474, is the page of diagrams of configurations, for the same month. The vertical row of light disks O in the middle of the page represents the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are arranged above each other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, for the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Frequently, at the epoch of the configuration, one or more satellites will be invisible, being projected on the disk of the planet: this phenomenon is indicated by a light disk O at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval on the above diagram of the orbits, by means of the following table of the periods:—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d
I.	1	18	28	35.945	=	1.76986048
II.	3	13	17	53.735	=	3.55409416
III.	7	3	59	35.854	=	7.16638720
IV.	16	18	5	6.928	=	16.75355241

WASHINGTON MEAN TIMES OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE I.

		h m			h m			h m			h m
Jan.	0	23 48.9	Mar.	19	21 4.1	Aug.	3	5 54.8	Oct.	18	8 26.8
	2	18 16.4		21	15 34.2		5	0 24.6		20	2 54.0
	4	12 44.2		23	10 4.3		6	18 54.1		21	21 21.3
	6	7 11.9		25	4 34.5		8	13 23.7		23	15 48.4
	8	1 39.6		26	23 4.6		10	7 53.3		25	10 15.5
	9	20 7.4		28	17 34.9		12	2 22.9		27	4 42.5
	11	14 35.2		30	12 5.0		13	20 52.4		28	23 9.5
	13	9 3.3	Apr.	1	6 35.3		15	15 21.9		30	17 36.4
	15	3 31.3		3	1 5.5		17	9 51.3	Nov.	1	12 3.2
	16	21 59.5		4	19 35.9		19	4 20.7		3	6 29.9
	18	16 27.6		6	14 6.2		20	22 49.9		5	0 56.7
	20	10 55.9		8	8 36.5		22	17 19.2		6	19 23.3
	22	5 24.3		10	3 6.8		24	11 48.3		8	13 50.0
	23	23 52.7		11	21 37.2		26	6 17.5		10	8 16.6
	25	18 21.1		13	16 7.6		28	0 46.7		12	2 43.1
	27	12 49.8		15	10 38.0		29	19 15.7		13	21 9.4
	29	7 18.4		17	5 8.4		31	13 44.8		15	15 35.8
	31	1 47.3		18	23 38.8	Sept.	2	8 13.8		17	10 2.0
Feb.	1	20 16.0		20	18 9.1		4	2 42.7		19	4 28.3
	3	14 44.9		22	12 39.6		5	21 11.6		20	22 54.5
	5	9 13.8		24	7 10.1		7	15 40.3		22	17 20.6
	7	3 42.8		26	1 40.6		9	10 9.1		24	11 46.6
	8	22 11.8		27	20 11.0		11	4 37.8		26	6 12.7
	10	16 41.0					12	23 6.5		28	0 38.7
	12	11 10.1					14	17 35.0		29	19 4.7
	14	5 39.4	June	30	14 25.7		16	12 3.6	Dec.	1	13 30.7
	16	0 8.6	July	2	8 55.9		18	6 32.1		3	7 56.7
	17	18 38.1		4	3 26.1		20	1 0.5		5	2 22.7
	19	13 7.4		5	21 56.2		21	19 29.0		6	20 48.6
	21	7 36.9		7	16 26.3		23	13 57.4		8	15 14.4
	23	2 6.4		9	10 56.3		25	8 25.6		10	9 40.4
	24	20 36.0		11	5 26.4		27	2 53.8		12	4 6.2
	26	15 5.6		12	23 56.5		28	21 21.8		13	22 32.1
	28	9 35.4		14	18 26.5		30	15 49.9		15	16 57.9
Mar.	2	4 4.9		16	12 56.5	Oct.	2	10 17.8		17	11 23.8
	3	22 34.7		18	7 26.4		4	4 45.8		19	5 49.6
	5	17 4.4		20	1 56.4		5	23 13.7		21	0 15.6
	7	11 34.3		21	20 26.3		7	17 41.5		22	18 41.5
	9	6 4.1		23	14 56.2		9	12 9.1		24	13 7.6
	11	0 34.1		25	9 26.1		11	6 36.8		26	7 33.5
	12	19 3.9		27	3 55.9		13	1 4.4		28	1 59.6
	14	13 34.0		28	22 25.7		14	19 31.9		29	20 25.6
	16	8 4.0		30	16 55.4		16	13 59.4		31	14 51 7
	18	2 34.0	Aug.	1	11 25.1						

WASHINGTON MEAN TIMES OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE II.

		h	m			h	m			h	m			h	m
Jan.	0	1	17.3	Mar.	22	19	14.3	Aug.	1	11	47.2	Oct.	18	16	56.3
	3	14	29.1		26	8	37.7		5	1	11.7		22	6	9.9
	7	3	42.1		29	22	1.1		8	14	34.7		25	19	21.3
	10	16	55.4	Apr.	2	11	24.8		12	3	58.5		29	8	34.7
	14	6	9.3		6	0	48 9		15	17	20.9	Nov.	1	21	45.9
	17	19	23.8		9	14	13.2		19	6	44.0		5	10	57.0
	21	8	39.0		13	3	37.8		22	20	5.6		9	0	6.9
	24	21	54.7		16	17	2.3		26	9	27.9		12	13	16.9
	28	11	11.0		20	6	27.4		29	22	48.8		16	2	25.7
Feb.	1	0	27.9		23	19	52 3	Sept.	2	12	10.4		19	15	34.6
	4	13	45.4		27	9	17.7		6	1	30.5		23	4	42.7
	8	3	3.4						9	14	51.2		26	17	50.7
	11	16	21.8						13	4	10.3		30	6	58.0
	15	5	40.9	June	30	11	3.2		16	17	30.1	Dec.	3	20	5.5
	18	19	0.3	July	4	0	28.2		20	6	48.2		7	9	12.4
	22	8	20.3		7	13	54.2		23	20	6.8		10	22	19.3
	25	21	40.7		11	3	18.9		27	9	23.8		14	11	25.8
Mar.	1	11	1.5		14	16	44.8		30	22	41.2		18	0	32.4
	5	0	22.8		18	6	9.2	Oct.	4	11	57.1		21	13	38.9
	8	13	44.5		21	19	34.5		8	1	13.3		25	2	45.9
	12	3	6.4		25	8	58.6		11	14	28.0		28	15	52.7
	15	16	28.7		28	22	23.6		15	3	42.8		32	4	59.9
	19	5	51.3												

SATELLITE III.

		h	m			h	m			h	m			h	m
Jan.	3	12	18.7	Mar.	30	13	25.3	July	30	17	22.1	Oct.	17	14	16.0
	10	16	2.0	Apr.	6	17	49.9	Aug.	6	21	42.9		24	17	55.8
	17	19	49.6		13	22	17.0		14	2	1.4		31	21	32.0
	24	23	41.6		21	2	45.0		21	6	16.7	Nov.	8	1	2.6
Feb.	1	3	38.2		28	7	14.0		28	10	29.4		15	4	29.4
	8	7	39.1					Sept.	4	14	39.5		22	7	51.8
	15	11	44.3						11	18	45.7		29	11	10.7
	22	15	53.8	July	1	23	42.5		18	22	48.4	Dec.	6	14	27.2
Mar.	1	20	6.7		9	4	9.1		26	2	47.5		13	17	42.4
	9	0	22.9		16	8	34.7	Oct.	3	6	41.7		20	20	57.9
	16	4	41.5		23	12	59.6		10	10	31.3		28	0	13.7
	23	9	2.5												

SATELLITE IV.

		h	m			h	m			h	m			h	m
Jan.	6	6	58.3	Apr.	17	0	39.9	July	27	5	38.0	Oct.	19	3	2.9
	22	23	51.3	May	3	21	26.4	Aug.	13	1	41.2	Nov.	4	19	10.9
Feb.	8	17	47.0						29	21	7.0		21	10	14.1
	25	12	33.5					Sept.	15	16	1.3	Dec.	8	0	20.1
Mar.	14	8	9.5	June	23	12	16.1	Oct.	2	10	1.7		24	13	20.9
	31	4	17 3	July	10	9	1.7								

WASHINGTON MEAN TIME.

JANUARY.

d	h	m	s			
1	1	58	29.9	I.	Ec.	Re.
	18	35		II.	Tr.	In.
	19	57		I.	Tr.	In.
	20	46		II.	Sh.	In.
	21	3		I.	Sh.	In.
	21	12		II.	Tr.	Eg.
	22	9		I.	Tr.	Eg.
	23	15		I.	Sh.	Eg.
	23	23		II.	Sh.	Eg.
2	17	10		I.	Oc.	Dis.
	20	27	31.3	I.	Ec.	Re.
3	11	23		III.*	Oc.	Dis.
	13	10		II. *	Oc.	Dis.
	13	15		III.*	Oc.	Re.
	14	24		I.	Tr.	In.
	15	31		I.	Sh.	In.
	16	5	34.2	III.	Ec.	Dis.
	16	36		I.	Tr.	Eg.
	17	41	19.0	III.	Ec.	Re.
	17	43		I.	Sh.	Eg.
	17	58	19.2	II.	Ec.	Re.
4	11	38		I. *	Oc.	Dis.
	14	56	24.9	I.	Ec.	Re.
5	7	49		II. *	Tr.	In.
	8	50		I. *	Tr.	In.
	10	0		I. *	Sh.	In.
	10	5		II. *	Sh.	In.
	10	26		II. *	Tr.	Eg.
	11	3		I. *	Tr.	Eg.
	12	12		I. *	Sh.	Eg.
	12	42		II. *	Sh.	Eg.
6	6	6		I. *	Oc.	Dis.
	9	25	26.6	I. *	Ec.	Re.
7	1	23		III.	Tr.	In.
	2	24		II.	Oc.	Dis.
	3	17		III.	Tr.	Eg.
	3	18		I.	Tr.	In.
	4	29		I.	Sh.	In.
	5	31		I. *	Tr.	Eg.
	6	8		III.*	Sh.	In.
	6	41		I. *	Sh.	Eg.
	7	16	10.8	II. *	Ec.	Re.
	8	0		III.*	Sh.	Eg.
8	0	33		I.	Oc.	Dis.
	3	54	22.7	I.	Ec.	Re.
	21	4		II.	Tr.	In.
	21	46		I.	Tr.	In.
	22	58		I.	Sh.	In.
	23	24		II.	Sh.	In.
	23	41		II.	Tr.	Eg.
	23	59		I.	Tr.	Eg.
9	1	10		I.	Sh.	Eg.
	2	1		II.	Sh.	Eg.
	19	1		I.	Oc.	Dis.
	22	23	25.0	I.	Ec.	Re.
10	15	4		III.	Oc.	Dis.
	15	37		II.	Oc.	Dis.
	16	14		I.	Tr.	In.
	17	0		III.	Oc.	Re.
	17	27		I.	Sh.	In.
	18	27		I.	Tr.	Eg.
	19	39		I.	Sh.	Eg.
	20	7	23.9	III.	Ec.	Dis.
	20	34	3.3	II.	Ec.	Re.
10	21	43	42.5	III.	Ec.	Re.
11	13	29		I. *	Oc.	Dis.
	16	52	19.4	I.	Ec.	Re.
12	10	19		II. *	Tr.	In.
	10	42		I. *	Tr.	In.
	11	56		I. *	Sh.	In.
	12	43		II. *	Sh.	In.
	12	55		I. *	Tr.	Eg.
	12	56		II. *	Tr.	Eg.
	14	8		I.	Sh.	Eg.
	15	21		II.	Sh.	Eg.
13	7	57		I. *	Oc.	Dis.
	11	21	21.7	I. *	Ec.	Re.
14	4	50		II.	Oc.	Dis.
	5	5		III.	Tr.	In.
	5	10		I.	Tr.	In.
	6	24		I. *	Sh.	In.
	7	3		III.*	Tr.	Eg.
	7	23		I. *	Tr.	Eg.
	8	36		I. *	Sh.	Eg.
	9	51	57.6	II. *	Ec.	Re.
	10	9		III.*	Sh.	In.
	12	1		III.*	Sh.	Eg.
15	2	25		I.	Oc.	Dis.
	5	50	18.6	I. *	Ec.	Re.
	23	34		II.	Tr.	In.
	23	38		I.	Tr.	In.
16	0	53		I.	Sh.	In.
	1	51		I.	Tr.	Eg.
	2	3		II.	Sh.	In.
	2	12		II.	Tr.	Eg.
	3	5		I.	Sh.	Eg.
	4	41		II.	Sh.	Eg.
	20	53		I.	Oc.	Dis.
17	0	19	21.3	I.	Ec.	Re.
	18	5		II.	Oc.	Dis.
	18	6		I.	Tr.	In.
	18	50		III.	Oc.	Dis.
	19	22		I.	Sh.	In.
	20	19		I.	Tr.	Eg.
	20	49		III.	Oc.	Re.
	21	34		I.	Sh.	Eg.
	23	9	52.2	II.	Ec.	Re.
18	0	9	43.5	III.	Ec.	Dis.
	1	46	38.3	III.	Ec.	Re.
	15	21		I.	Oc.	Dis.
	18	48	16.5	I.	Ec.	Re.
19	12	34		I. *	Tr.	In.
	12	50		II. *	Tr.	In.
	13	51		I.	Sh.	In.
	14	47		I.	Tr.	Eg.
	15	22		II.	Sh.	In.
	15	29		II.	Tr.	Eg.
	16	3		I.	Sh.	Eg.
	18	0		II.	Sh.	Eg.
20	9	50		I. *	Oc.	Dis.
	13	17	19.0	I.	Ec.	Re.
21	7	2		I. *	Tr.	In.
	7	20		II. *	Oc.	Dis.
	8	20		I. *	Sh.	In.
	8	53		III.*	Tr.	In.
	9	15		I. *	Tr.	Eg.
	10	32		I. *	Sh.	Eg.
21	10	53		III.*	Tr.	Eg.
	12	27	49.3	II. *	Ec.	Re.
	14	10		III.	Sh.	In.
	16	2		III.	Sh.	Eg.
22	4	18		I.	Oc.	Dis.
	7	46	16.2	I. *	Ec.	Re.
23	1	30		I.	Tr.	In.
	2	7		II.	Tr.	In.
	2	49		I.	Sh.	In.
	3	43		I.	Tr.	Eg.
	4	41		II.	Sh.	In.
	4	46		II.	Tr.	Eg.
	5	1		I.	Sh.	Eg.
	7	20		II. *	Sh.	Eg.
	22	46		I.	Oc.	Dis.
24	2	15	19.3	I.	Ec.	Re.
	19	58		I.	Tr.	In.
	20	35		II.	Oc.	Dis.
	21	17		I.	Sh.	In.
	22	11		I.	Tr.	Eg.
	22	41		III.	Oc.	Dis.
	23	30		I.	Sh.	Eg.
25	0	42		III.	Oc.	Re.
	1	45	45.9	II.	Ec.	Re.
	4	11	24.7	III.	Ec.	Dis.
	5	48	57.9	III.*	Ec.	Re.
	17	15		I.	Oc.	Dis.
	20	44	14.5	I.	Ec.	Re.
26	14	26		I.	Tr.	In.
	15	25		II.	Tr.	In.
	15	46		I.	Sh.	In.
	16	39		I.	Tr.	Eg.
	17	58		I.	Sh.	Eg.
	18	1		II.	Sh.	In.
	18	4		II.	Tr.	Eg.
	20	40		II.	Sh.	Eg.
27	11	43		I. *	Oc.	Dis.
	15	13	17.0	I.	Ec.	Re.
28	8	54		I. *	Tr.	In.
	9	52		II. *	Oc.	Dis.
	10	15		I. *	Sh.	In.
	11	7		I. *	Tr.	Eg.
	12	27		I. *	Sh.	Eg.
	12	46		III.*	Tr.	In.
	14	48		III.	Tr.	Eg.
	15	3	45.1	II.	Ec.	Re.
	18	12		III.	Sh.	In.
	20	5		III.	Sh.	Eg.
29	6	12		I. *	Oc.	Dis.
	9	42	14.2	I. *	Ec.	Re.
30	3	23		I.	Tr.	In.
	4	43		II.	Tr.	In.
	4	44		I.	Sh.	In.
	5	36		I. *	Tr.	Eg.
	6	56		I. *	Sh.	Eg.
	7	21		II. *	Sh.	In.
	7	22		II. *	Tr.	Eg.
	9	59		II. *	Sh.	Eg.
31	0	41		I.	Oc.	Dis.
	4	11	17.3	I.	Ec.	Re.
	21	52		I.	Tr.	In.
	23	8		II.	Oc.	Dis.
	23	13		I.	Sh.	In.

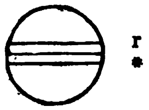
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

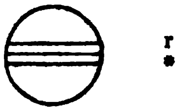
JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

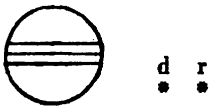
I.



II.



III.



Configurations at 9h 30m for an Inverting Telescope.

Day.	West.		East.
1	4· 3·	○	2· ·1
2	·4 ·3 2· ·1	○	
3	·4 ·2 ·	③	1·
4	.4 ·1	○	·2·3
5	○ 1· ○ 2· ·4	○	3·
6	·2	○	·4 ·1 3·
7	1· 3·	○	·2 ·4
8	3·	○	·12· ·4
9	·3 2·	○	·1 ·4
10	·2 ·3	○	1· ·4
11	·1	○	·2 ·3 4·
12		○	2·1· ·3 4·
13	·2	○	3·4· ·1 ●
14	1· 3·	○	4· ·2 ●
15	3· 4·	○	·1 2·
16	4· ·3 1· 2·	○	
17	4· ·2 ·3	○	1·
18	4· ·1	○	·3 ·2
19	·4	○	2·1· ·3
20	·4 2· ·	①	3·
21	○ 3· ·4 1·	○	·2 ●
22	3· ·4	○	·1 2·
23	·3 1· 2·	○	·4
24	·2 ·3	○	·1 ·4
25	·1	○	·3 ·2 ·4
26		○	1· 2· ·3 .4
27	2· ·1	○	3· 4·
28	○ 1· ·	②	3· 4·
29	3·	○	2· 4· ·1 ●
30	·3 1· 2·	○	4·
31	·3 ·2 4	○	·1

WASHINGTON MEAN TIME.

FEBRUARY.

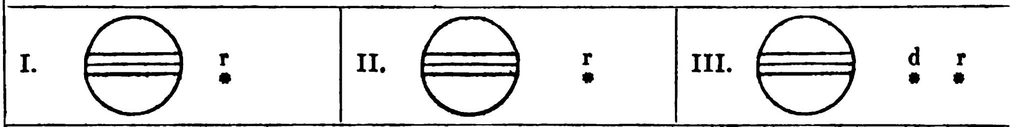
d	h	m	s				d	h	m	s				d	h	m	s			
1	0	5		I.	Tr.	Eg.	9	23	19		II.	Tr.	Eg.	19	8	11		III.*	Sh.	Eg.
	1	25		I.	Sh.	Eg.		23	19		II.	Sh.	In.		12	1		I.	Oc.	Dis.
	2	36		III.	Oc.	Dis.	10	1	57		II.	Sh.	Eg.		15	30	3.4	I.	Ec.	Re.
	4	21	43.8	II.	Ec.	Re.		15	35		I.	Oc.	Dis.	20	9	11		I. *	Tr.	In.
	4	41		III.	Oc.	Re.		19	5	11.9	I.	Ec.	Re.		10	30		I. *	Sh.	In.
	8	12	58.3	III.*	Ec.	Dis.	11	12	46		I.	Tr.	In.		11	24		I.	Tr.	Eg.
	9	51	12.1	III.*	Ec.	Re.		14	6		I.	Sh.	In.		12	41		II.	Tr.	In.
	19	10		I.	Oc.	Dis.		14	59		I.	Tr.	Eg.		12	42		I.	Sh.	Eg.
	22	40	12.4	I.	Ec.	Re.		15	2		II.	Oc.	Dis.		15	17		II.	Sh.	In.
2	16	21		I.	Tr.	In.		16	18		I.	Sh.	Eg.		15	20		II.	Tr.	Eg.
	17	42		I.	Sh.	In.		20	15	50.6	II.	Ec.	Re.		17	55		II.	Sh.	Eg.
	18	1		II.	Tr.	In.		20	46		III.	Tr.	In.	21	6	30		I. *	Oc.	Dis.
	18	34		I.	Tr.	Eg.		22	52		III.	Tr.	Eg.		9	59	5.0	I. *	Ec.	Re.
	19	54		I.	Sh.	Eg.	12	2	15		III.	Sh.	In.	22	3	40		I.	Tr.	In.
	20	40		II.	Tr.	Eg.		4	9		III.	Sh.	Eg.		4	59		I.	Sh.	In.
	20	40		II.	Sh.	In.		10	4		I. *	Oc.	Dis.		5	53		I.	Tr.	Eg.
	23	19		II.	Sh.	Eg.		13	34	8.6	I.	Ec.	Re.		7	0		II. *	Oc.	Dis.
3	13	39		I.	Oc.	Dis.	13	7	15		I. *	Tr.	In.		7	11		I. *	Sh.	Eg.
	17	9	14.7	I.	Ec.	Re.		8	35		I. *	Sh.	In.		12	10	7.4	II.	Ec.	Re.
4	10	50		I. *	Tr.	In.		9	28		I. *	Tr.	Eg.		14	50		III.	Oc.	Dis.
	12	10		I. *	Sh.	In.		10	0		II. *	Tr.	In.		16	58		III.	Oc.	Re.
	12	26		II.	Oc.	Dis.		10	47		I. *	Sh.	Eg.		20	17	38.3	III.	Ec.	Dis.
	13	3		I.	Tr.	Eg.		12	38		II.	Sh.	In.		21	58	8.1	III.	Ec.	Re.
	14	22		I.	Sh.	Eg.		12	39		II.	Tr.	Eg.	23	1	0		I.	Oc.	Dis.
	16	43		III.	Tr.	In.		15	16		II.	Sh.	Eg.		4	27	58.9	I.	Ec.	Re.
	17	39	45.7	II.	Ec.	Re.	14	4	33		I.	Oc.	Dis.		22	10		I.	Tr.	In.
	18	48		III.	Tr.	Eg.		8	3	11.2	I. *	Ec.	Re.		23	28		I.	Sh.	In.
	22	13		III.	Sh.	In.	15	1	44		I.	Tr.	In.	24	0	23		I.	Tr.	Eg.
5	0	6		III.	Sh.	Eg.		3	3		I.	Sh.	In.		1	40		I.	Sh.	Eg.
	8	7		I. *	Oc.	Dis.		3	57		I.	Tr.	Eg.		2	2		II.	Tr.	In.
	11	38	11.9	I. *	Ec.	Re.		4	21		II.	Oc.	Dis.		4	36		II.	Sh.	In.
6	5	19		I.	Tr.	In.		5	15		I.	Sh.	Eg.		4	42		II.	Tr.	Eg.
	6	39		I. *	Sh.	In.		9	33	54.8	II. *	Ec.	Re.		7	14		II. *	Sh.	Eg.
	7	20		II. *	Tr.	In.		10	41		III.*	Oc.	Dis.		19	29		I.	Oc.	Dis.
	7	32		I. *	Tr.	Eg.		12	48		III.	Oc.	Re.		22	56	59.2	I.	Ec.	Re.
	8	51		I. *	Sh.	Eg.		16	15	44.8	III.	Ec.	Dis.	25	16	40		I.	Tr.	In.
	9	59		II. *	Tr.	Eg.		17	55	27.0	III.	Ec.	Re.		17	56		I.	Sh.	In.
	10	0		II. *	Sh.	In.		23	2		I.	Oc.	Dis.		18	53		I.	Tr.	Eg.
	12	38		II.	Sh.	Eg.	16	2	32	5.8	I.	Ec.	Re.		20	8		I.	Sh.	Eg.
7	2	36		I.	Oc.	Dis.		20	13		I.	Tr.	In.		20	21		II.	Oc.	Dis.
	6	7	14.8	I. *	Ec.	Re.		21	32		I.	Sh.	In.	26	1	28	15.8	II.	Ec.	Re.
	23	48		I.	Tr.	In.		22	26		I.	Tr.	Eg.		5	2		III.	Tr.	In.
8	1	8		I.	Sh.	In.		23	20		II.	Tr.	In.		7	11		III.*	Tr.	Eg.
	1	43		II.	Oc.	Dis.		23	44		I.	Sh.	Eg.		10	18		III.*	Sh.	In.
	2	1		I.	Tr.	Eg.	17	1	58		II.	Sh.	In.		12	13		III.	Sh.	Eg.
	3	20		I.	Sh.	Eg.		1	59		II.	Tr.	Eg.		13	59		I.	Oc.	Dis.
	6	36		III.*	Oc.	Dis.		4	36		II.	Sh.	Eg.		17	25	54.3	I.	Ec.	Re.
	6	57	46.6	II. *	Ec.	Re.		17	32		I.	Oc.	Dis.	27	11	9		I. *	Tr.	In.
	8	42		III.*	Oc.	Re.		21	1	7.2	I.	Ec.	Re.		12	25		I.	Sh.	In.
	12	14	19.9	III.	Ec.	Dis.	18	14	42		I.	Tr.	In.		13	22		I.	Tr.	Eg.
	13	53	16.7	III.	Ec.	Re.		16	1		I.	Sh.	In.		14	37		I.	Sh.	Eg.
	21	5		I.	Oc.	Dis.		16	55		I.	Tr.	Eg.		15	24		II.	Tr.	In.
9	0	36	9.8	I.	Ec.	Re.		17	40		II.	Oc.	Dis.		17	55		II.	Sh.	In.
	18	17		I.	Tr.	In.		18	13		I.	Sh.	Eg.		18	4		II.	Tr.	Eg.
	19	37		I.	Sh.	In.		22	52	0.7	II.	Ec.	Re.		20	33		II.	Sh.	Eg.
	20	30		I.	Tr.	Eg.	19	0	52		III.	Tr.	In.	28	8	29		I. *	Oc.	Dis.
	20	40		II.	Tr.	In.		3	0		III.	Tr.	Eg.		11	54	55.1	I.	Ec.	Re.
	21	49		I.	Sh.	Eg.		6	17		III.*	Sh.	In.							

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9h for an Inverting Telescope.

Day.	West.		East.
1	4· 1·	○	·3 ·2
2	4·	○	1· 2· ·3
3	4· 2· ·1	○	3·
4	4· ·2	○	1· 3·
5	·4 3·	○	·2 ·1 ●
6	○ 2· ·4 3· 1·	○	
7	·4 ·3 ·2	○	.1
8	1· ·4	○	·2 ·3 ●
9		○	1· 2· ·4 ·3
10	2· ·1	○	3· ·4
11	·2	○	1· 3· ·4
12	3· ·1	○	·2 ·4
13	○ 1· 3·	○	2. 4·
14	·3 ·2	○	·1 4·
15	1· ·3	○	4· ·2 ●
16		○	·1 ·3 4·2·
17	2· ·1 4·	○	3·
18	4· ·2	○	1· 3·
19	4·. 3· ·1	○	·2
20	4· 3·	①.	2·
21	·4 ·3 2·	○	·1
22	·4 1· ·3	○	·2 ●
23	.4	○	·1 2· ·3
24	·4 1· 2·	○	·3
25	·2 ·4	○	1· 3·
26	·1 3·	○	·2 ·4
27	3·	○	1· 2· ·4
28	·3 2·	○	·4 ·1 ●

WASHINGTON MEAN TIME.

MARCH.

d	h	m	s				
1	5	39		I.		Tr.	In.
	6	54		I.	*	Sh.	In.
	7	52		I.	*	Tr.	Eg.
	9	6		I.	*	Sh.	Eg.
	9	41		II.	*	Oc.	Dis.
	14	46	26.1	II.		Ec.	Re.
	19	2		III.		Oc.	Dis.
	21	12		III.		Oc.	Re.
2	0	19	12.0	III.		Ec.	Dis.
	2	0	31.6	III.		Ec.	Re.
	2	58		I.		Oc.	Dis.
	6	23	48.2	I.	*	Ec.	Re.
3	0	9		I.		Tr.	In.
	1	23		I.		Sh.	In.
	2	22		I.		Tr.	Eg.
	3	35		I.		Sh.	Eg.
	4	46		II.		Tr.	In.
	7	14		II.	*	Sh.	In.
	7	26		II.	*	Tr.	Eg.
	9	53		II.	*	Sh.	Eg.
	21	28		I.		Oc.	Dis.
4	0	52	47.2	I.		Ec.	Re.
	18	38		I.		Tr.	In.
	19	52		I.		Sh.	In.
	20	51		I.		Tr.	Eg.
	22	4		I.		Sh.	Eg.
	23	3		II.		Oc.	Dis.
5	4	4	36.5	II.		Ec.	Re.
	9	15		III.	*	Tr.	In.
	11	25		III.		Tr.	Eg.
	14	19		III.		Sh.	In.
	15	58		I.		Oc.	Dis.
	16	14		III.		Sh.	Eg.
	19	21	41.6	I.		Ec.	Re.
6	13	8		I.		Tr.	In.
	14	21		I.		Sh.	In.
	15	21		I.		Tr.	Eg.
	16	33		I.		Sh.	Eg.
	18	8		II.		Tr.	In.
	20	33		II.		Sh.	In.
	20	48		II.		Tr.	Eg.
	23	12		II.		Sh.	Eg.
7	10	28		I.	*	Oc.	Dis.
	13	50	41.4	I.		Ec.	Re.
8	7	38		I.	*	Tr.	In.
	8	50		I.	*	Sh.	In.
	9	51		I.	*	Tr.	Eg.
	11	1		I.		Sh.	Eg.
	12	24		II.		Oc.	Dis.
	17	22	50.1	II.		Ec.	Re.
	23	18		III.		Oc.	Dis.
9	1	28		III.		Oc.	Re.
	4	21	8.5	III.		Ec.	Dis.
	4	58		I.		Oc.	Dis.
	6	3	20.1	III.		Ec.	Re.
	8	19	33.6	I.	*	Ec.	Re.
10	2	8		I.		Tr.	In.
	3	18		I.		Sh.	In.
	4	21		I.		Tr.	Eg.
	5	30		I.		Sh.	Eg.
	7	31		II.	*	Tr.	In.
	9	52		II.	*	Sh.	In.
	10	11		II.	*	Tr.	Eg.
	12	31		II.		Sh.	Eg.
	23	27		I.		Oc.	Dis.
11	2	48	31.6	I.		Ec.	Re.
11	20	37		I.		Tr.	In.
	21	47		I.		Sh.	In.
	22	51		I.		Tr.	Eg.
	23	59		I.		Sh.	Eg.
12	1	46		II.		Oc.	Dis.
	6	41	1.9	II.	*	Ec.	Re.
	13	31		III.		Tr.	In.
	15	42		III.		Tr.	Eg.
	17	57		I.		Oc.	Dis.
	18	19		III.		Sh.	In.
	20	16		III.		Sh.	Eg.
	21	17	24.9	I.		Ec.	Re.
13	15	7		I.		Tr.	In.
	16	16		I.		Sh.	In.
	17	20		I.		Tr.	Eg.
	18	28		I.		Sh.	Eg.
	20	54		II.		Tr.	In.
	23	11		II.		Sh.	In.
	23	34		II.		Tr.	Eg.
14	1	50		II.		Sh.	Eg.
	12	27		I.		Oc.	Dis.
	15	46	23.5	I.		Ec.	Re.
15	9	37		I.	*	Tr.	In.
	10	45		I.		Sh.	In.
	11	50		I.		Tr.	Eg.
	12	57		I.		Sh.	Eg.
	15	9		II.		Oc.	Dis.
	19	59	19.4	II.		Ec.	Re.
16	3	36		III.		Oc.	Dis.
	5	47		III.		Oc.	Re.
	6	57		I.	*	Oc.	Dis.
	8	22	21.5	III.	*	Ec.	Dis.
	10	5	26.9	III.	*	Ec.	Re.
	10	15	14.9	I.	*	Ec.	Re.
17	4	7		I.		Tr.	In.
	5	14		I.		Sh.	In.
	6	20		I.		Tr.	Eg.
	7	26		I.	*	Sh.	Eg.
	10	17		II.		Tr.	In.
	12	30		II.		Sh.	In.
	12	57		II.		Tr.	Eg.
	15	9		II.		Sh.	Eg.
18	1	27		I.		Oc.	Dis.
	4	44	11.6	I.		Ec.	Re.
	22	37		I.		Tr.	In.
	23	42		I.		Sh.	In.
19	0	50		I.		Tr.	Eg.
	1	54		I.		Sh.	Eg.
	4	31		II.		Oc.	Dis.
	9	17	32.7	II.	*	Ec.	Re.
	17	51		III.		Tr.	In.
	19	57		I.		Oc.	Dis.
	20	2		III.		Tr.	Eg.
	22	21		III.		Sh.	In.
	23	13	3.6	I.		Ec.	Re.
20	0	18		III.		Sh.	Eg.
	17	7		I.		Tr.	In.
	18	11		I.		Sh.	In.
	19	20		I.		Tr.	Eg.
	20	23		I.		Sh.	Eg.
	23	40		II.		Tr.	In.
21	1	49		II.		Sh.	In.
	2	21		II.		Tr.	Eg.
	4	28		II.		Sh.	Eg.
	14	28		I.		Oc.	Dis.
21	17	42	1.0	I.		Ec.	Re.
22	11	37		I.		Tr.	In.
	12	40		I.		Sh.	In.
	13	50		I.		Tr.	Eg.
	14	52		I.		Sh.	Eg.
	17	54		II.		Oc.	Dis.
	22	35	53.8	II.		Ec.	Re.
23	7	57		III.	*	Oc.	Dis.
	8	58		I.	*	Oc.	Dis.
	10	8		III.		Oc.	Re.
	12	10	50.9	I.		Ec.	Re.
	12	23	21.3	III.		Ec.	Dis.
	14	7	22.5	III.		Ec.	Re.
24	6	7		I.		Tr.	In.
	7	8		I.	*	Sh.	In.
	8	20		I.	*	Tr.	Eg.
	9	21		I.	*	Sh.	Eg.
	13	4		II.		Tr.	In.
	15	8		II.		Sh.	In.
	15	45		II.		Tr.	Eg.
	17	47		II.		Sh.	Eg.
25	3	28		I.		Oc.	Dis.
	6	39	46.1	I.	*	Ec.	Re.
26	0	37		I.		Tr.	In.
	1	37		I.		Sh.	In.
	2	50		I.		Tr.	Eg.
	3	50		I.		Sh.	Eg.
	7	17		II.	*	Oc.	Dis.
	11	54	8.3	II.		Ec.	Re.
	21	58		I.		Oc.	Dis.
	22	13		III.		Tr.	In.
27	0	24		III.		Tr.	Eg.
	1	8	36.6	I.		Ec.	Re.
	2	22		III.		Sh.	In.
	4	20		III.		Sh.	Eg.
	19	7		I.		Tr.	In.
	20	6		I.		Sh.	In.
	21	20		I.		Tr.	Eg.
	22	19		I.		Sh.	Eg.
28	2	28		II.		Tr.	In.
	4	27		II.		Sh.	In.
	5	9		II.		Tr.	Eg.
	7	6		II.	*	Sh.	Eg.
	16	28		I.		Oc.	Dis.
	19	37	32.6	I.		Ec.	Re.
29	13	37		I.		Tr.	In.
	14	34		I.		Sh.	In.
	15	50		I.		Tr.	Eg.
	16	47		I.		Sh.	Eg.
	20	41		II.		Oc.	Dis.
30	1	12	33.9	II.		Ec.	Re.
	10	58		I.		Oc.	Dis.
	12	19		III.		Oc.	Dis.
	14	6	21.2	I.		Ec.	Re.
	14	31		III.		Oc.	Re.
	16	24	6.5	III.		Ec.	Dis.
	18	9	5.1	III.		Ec.	Re.
31	8	7		I.	*	Tr.	In.
	9	3		I.	*	Sh.	In.
	10	21		I.		Tr.	Eg.
	11	16		I.		Sh.	Eg.
	15	52		II.		Tr.	In.
	17	46		II.		Sh.	In.
	18	33		II.		Tr.	Eg.
	20	25		II.		Sh.	Eg.

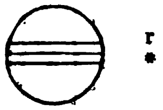
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

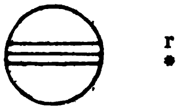
MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

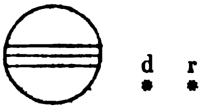
I.



II.



III.



Configurations at 8h 30m for an Inverting Telescope.

Day.	West.	East.
1	·3 $\frac{1}{2}$	○ ·4
2		○ ·1 ·3 2· 4·
3	1· 2·	○ ·3 4·
4	·2	○ ·1 3· 4·
5	·1 3	○· ·2 4.
6	3· 4·	○ 1· 2·
7	4· ·3 2· ·1	○
8	○ 1. 4· ·3 ·2	○
9	4·	○ ·1 ·3 ·2
10	○ 2. ·4 1·	○ ·3
11	·4 .2	○ ·1 3·
12	·4 ·1	○ 3· ·2
13	3· ·4	○ 1· 2·
14	3· 2· ·1	○4
15	·3 ·2	○1· ·4
16		○ ·2 ·4 ·1 ● ·3 ●
17	1·	○2· ·3 ·4
18	2·	○ ·1 3· ·4
19	1·	○ ·2 3· 4·
20	3·	○ 1· 2· 4·
21	3· 2· ·1	○ 4·
22	·3 ·2	○ 1· 4·
23	4. ·1	○ ·2 ·3 ●
24	4· 1·	○ 2· ·3
25	4· 2·	○ ·1 ·3
26	4· 1·	○ 3· ·2 ●
27	·4 3·	○ ·1 2·
28	·4 3· ·1 2·	○
29	·4 ·3 ·2	○ 1·
30	·4 ·1 ·3	○ ·2
31	○ 1·	○ ·4 2· ·3

WASHINGTON MEAN TIME.

APRIL.

d	h	m	s				
1	5	29		I.		Oc.	Dis.
	8	35	14.7	I.	*	Ec.	Re.
2	2	37		I.		Tr.	In.
	3	32		I.		Sh.	In.
	4	51		I.		Tr.	Eg.
	5	45		I.		Sh.	Eg.
	10	5		II.		Oc.	Dis.
	14	30	49.7	II.		Ec.	Re.
	23	59		I.		Oc.	Dis.
3	2	37		III.		Tr.	In.
	3	4	4.0	I.		Ec.	Re.
	4	49		III.		Tr.	Eg.
	6	23		III.		Sh.	In.
	8	22		III.	*	Sh.	Eg.
	21	8		I.		Tr.	In.
	22	1		I.		Sh.	In.
	23	21		I.		Tr.	Eg.
4	0	14		I.		Sh.	Eg.
	5	16		II.		Tr.	In.
	7	5		II.	*	Sh.	In.
	7	57		II.	*	Tr.	Eg.
	9	44		II.		Sh.	Eg.
	18	29		I.		Oc.	Dis.
	21	32	58.4	I.		Ec.	Re.
5	15	38		I.		Tr.	In.
	16	30		I.		Sh.	In.
	17	52		I.		Tr.	Eg.
	18	43		I.		Sh.	Eg.
	23	29		II.		Oc.	Dis.
6	3	49	19.9	II.		Ec.	Re.
	13	0		I.		Oc.	Dis.
	16	1	45.8	I.		Ec.	Re.
	16	44		III.		Oc.	Dis.
	18	56		III.		Oc.	Re.
	20	24	51.9	III.		Ec.	Dis.
	22	10	49.7	III.		Ec.	Re.
7	10	8		I.		Tr.	In.
	10	59		I.		Sh.	In.
	12	22		I.		Tr.	Eg.
	13	12		I.		Sh.	Eg.
	18	41		II.		Tr.	In.
	20	23		II.		Sh.	In.
	21	22		II.		Tr.	Eg.
	23	2		II.		Sh.	Eg.
8	7	30		I.	*	Oc.	Dis.
	10	30	37.6	I.		Ec.	Re.
9	4	38		I.		Tr.	In.
	5	27		I.		Sh.	In.
	6	52		I.		Tr.	Eg.
	7	40		I.	*	Sh.	Eg.
	12	53		II.		Oc.	Dis.
	17	7	36.7	II.		Ec.	Re.
10	2	0		I.		Oc.	Dis.
	4	59	25.4	I.		Ec.	Re.
	7	2		III.	*	Tr.	In.
	9	15		III.		Tr.	Eg.
	10	24		III.		Sh.	In.
	12	24		III.		Sh.	Eg.
	23	9		I.		Tr.	In.
	23	56		I.		Sh.	In.
11	1	23		I.		Tr.	Eg.
11	2	9		I.		Sh.	Eg.
	8	6		II.	*	Tr.	In.
	9	42		II.		Sh.	In.
	10	47		II.		Tr.	Eg.
	12	20		II.		Sh.	Eg.
	20	30		I.		Oc.	Dis.
	23	28	18.1	I.		Ec.	Re.
12	17	39		I.		Tr.	In.
	18	25		I.		Sh.	In.
	19	53		I.		Tr.	Eg.
	20	38		I.		Sh.	Eg.
13	2	17		II.		Oc.	Dis.
	6	26	11.6	II.		Ec.	Re.
	15	1		I.		Oc.	Dis.
	17	57	3.9	I.		Ec.	Re.
	21	11		III.		Oc.	Dis.
	23	23		III.		Oc.	Re.
14	0	26	4.3	III.		Ec.	Dis.
	2	13	3.0	III.		Ec.	Re.
	12	9		I.		Tr.	In.
	12	54		I.		Sh.	In.
	14	23		I.		Tr.	Eg.
	15	7		I.		Sh.	Eg.
	21	31		II.		Tr.	In.
	23	0		II.		Sh.	In.
15	0	12		II.		Tr.	Eg.
	1	39		II.		Sh.	Eg.
	9	31		I.		Oc.	Dis.
	12	25	53.6	I.		Ec.	Re.
16	6	40		I.		Tr.	In.
	7	23		I.	*	Sh.	In.
	8	54		I.		Tr.	Eg.
	9	36		I.		Sh.	Eg.
	15	42		II.		Oc.	Dis.
	19	44	29.0	II.		Ec.	Re.
17	4	2		I.		Oc.	Dis.
	6	54	39.6	I.		Ec.	Re.
	11	29		III.		Tr.	In.
	13	42		III.		Tr.	Eg.
	14	24		III.		Sh.	In.
	16	25		III.		Sh.	Eg.
18	1	10		I.		Tr.	In.
	1	52		I.		Sh.	In.
	3	24		I.		Tr.	Eg.
	4	5		I.		Sh.	Eg.
	10	56		II.		Tr.	In.
	12	19		II.		Sh.	In.
	13	37		II.		Tr.	Eg.
	14	58		II.		Sh.	Eg.
	22	32		I.		Oc.	Dis.
19	1	23	30.6	I.		Ec.	Re.
	19	40		I.		Tr.	In.
	20	20		I.		Sh.	In.
	21	54		I.		Tr.	Eg.
	22	33		I.		Sh.	Eg.
20	5	7		II.		Oc.	Dis.
	9	3	8.3	II.		Ec.	Re.
	17	2		I.		Oc.	Dis.
	19	52	15.0	I.		Ec.	Re.
21	1	39		III.		Oc.	Dis.
	3	51		III.		Oc.	Re.
21	4	26	53.1	III.		Ec.	Dis.
	6	14	53.9	III.		Ec.	Re.
	14	11		I.		Tr.	In.
	14	49		I.		Sh.	In.
	16	25		I.		Tr.	Eg.
	17	2		I.		Sh.	Eg.
22	0	21		II.		Tr.	In.
	1	38		II.		Sh.	In.
	3	2		II.		Tr.	Eg.
	4	17		II.		Sh.	Eg.
	11	33		I.		Oc.	Dis.
	14	21	3.2	I.		Ec.	Re.
23	8	41		I.		Tr.	In.
	9	18		I.		Sh.	In.
	10	55		I.		Tr.	Eg.
	11	31		I.		Sh.	Eg.
	18	32		II.		Oc.	Dis.
	22	21	25.9	II.		Ec.	Re.
24	6	3		I.		Oc.	Dis.
	8	49	47.5	I.		Ec.	Re.
	15	57		III.		Tr.	In.
	18	10		III.		Tr.	Eg.
	18	25		III.		Sh.	In.
	20	26		III.		Sh.	Eg.
25	3	12		I.		Tr.	In.
	3	47		I.		Sh.	In.
	5	25		I.		Tr.	Eg.
	6	0		I.		Sh.	Eg.
	13	46		II.		Tr.	In.
	14	56		II.		Sh.	In.
	16	27		II.		Tr.	Eg.
	17	35		II.		Sh.	Eg.
26	0	34		I.		Oc.	Dis.
	3	18	36.8	I.		Ec.	Re.
	21	43		I.		Tr.	In.
	22	16		I.		Sh.	In.
	23	56		I.		Tr.	Eg.
27	0	29		I.		Sh.	Eg.
	7	57		II.	*	Oc.	Dis.
	11	40	9.5	II.		Ec.	Re.
	19	4		I.		Oc.	Dis.
	21	47	19.8	I.		Ec.	Re.
28	6	7		III.		Oc.	Dis.
	8	21		III.		Oc.	Re.
	8	28	0.3	III.		Ec.	Dis.
	10	17	4.3	III.		Ec.	Re.
	16	13		I.		Tr.	In.
	16	45		I.		Sh.	In.
	18	27		I.		Tr.	Eg.
	18	58		I.		Sh.	Eg.
29	3	11		II.		Tr.	In.
	4	14		II.		Sh.	In.
	5	52		II.		Tr.	Eg.
	6	53		II.		Sh.	Eg.
	13	35		I.		Oc.	Dis.
	16	16	6.8	I.		Ec.	Re.
30	10	44		I.		Tr.	In.
	11	14		I.		Sh.	In.
	12	57		I.		Tr.	Eg.
	13	27		I.		Sh.	Eg.
	21	22		II.		Oc.	Dis.

The Satellites are not visible during May and June, Jupiter being too near the Sun.

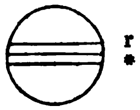
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; *Visible at Washington.

WASHINGTON MEAN TIME.

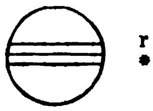
APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

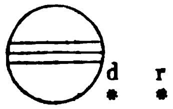
I.



II.



III.



Configurations at 8h for an Inverting Telescope.

Day.	West.		East.
1	2·	○	·4 ·3 ·1 ●
2	1· ·2	○	3· ·4
3	3·	○	·1 ·2 ·4
4	3· 1· 2·	○	·4
5	·3 ·2	○	1· 4·
6	·3 ·1	○	·2 4·
7		○	1· 2· ·3 4·
8	2·	○	4· ·3 ·1 ●
9	4· ·2 1·	○	3·
10	○ 3· 4·	○	·1 ·2
11	4· 3· 1· 2	○·	
12	4· ·3 ·2	○	·1
13	·4 ·3 ·1	○	·2
14	·4	○	1· ·3 2·
15	·4 2· ·1	○	·3
16	○ 1· ·4 ·2	○	3·
17		○	3· ·1 ·4 ·2
18	3· 1·	○	·2 ·4
19	·3 2·	○	·1 ·4
20	·3 ·1	○	·4 ·2 ●
21		○	·3 1· 2· 4·
22	2· ·1	○	·3 4·
23	·2	○	1· 3· 4·
24		○	3· ·2 4· ·1 ●
25	3· 1· 4	○·	2·
26	3· 2· 4·	○	·1
27	4· ·3 1·	○	·2 ●
28	4·	○	1· 2· ·3 ●
29	4· ·1 2·	○	·3
30	·4 ·2	○	1· 3·

WASHINGTON MEAN TIME.

JULY.

d	h	m	s				d	h	m	s				d	h	m	s			
1	9	58		I.	Sh.	In.	11	6	34		I.	Oc.	Re.	21	20	55		II.	Oc.	Re.
	10	30		I.	Tr.	In.	12	0	49		I.	Sh.	In.		21	34		I.	Oc.	Re.
	12	11		I.	Sh.	Eg.		1	31		I.	Tr.	In.	22	15	41		I.	* Sh.	In.
	12	44		I.	Tr.	Eg.		3	3		I.	Sh.	Eg.		16	32		I.	Tr.	In.
	20	27	24.9	III.	Ec.	Dis.		3	46		I.	Tr.	Eg.		17	55		I.	Sh.	Eg.
	22	26	53.1	III.	Ec.	Re.		14	27		III.	Sh.	In.		18	47		I.	Tr.	Eg.
	22	32		III.	Oc.	Dis.		16	40		III.	Sh.	Eg.	23	8	25	8.0	III.	Ec.	Dis.
2	0	53		III.	Oc.	Re.		17	18		III.	Tr.	In.		10	28	18.8	III.	Ec.	Re.
	3	34		II.	Sh.	In.		19	25		II.	Sh.	In.		11	16		II.	Sh.	In.
	4	41		II.	Tr.	In.		19	40		III.	Tr.	Eg.		11	48		III.	Oc.	Dis.
	6	14		II.	Sh.	Eg.		20	53		II.	Tr.	In.		12	59	12.1	I.	Ec.	Dis.
	7	17	44.5	I.	Ec.	Dis.		22	6		II.	Sh.	Eg.		13	3		II.	Tr.	In.
	7	23		II.	Tr.	Eg.		22	8	34.7	I.	Ec.	Dis.		13	58		II.	Sh.	Eg.
	10	3		I.	Oc.	Re.		23	35		II.	Tr.	Eg.		14	11		III.	Oc.	Re.
3	4	27		I.	Sh.	In.	13	1	4		I.	Oc.	Re.		15	45		II.	* Tr.	Eg.
	5	0		I.	Tr.	In.		19	18		I.	Sh.	In.		16	4		I.	* Oc.	Re.
	6	40		I.	Sh.	Eg.		20	1		I.	Tr.	In.	24	10	10		I.	Sh.	In.
	7	15		I.	Tr.	Eg.		21	32		I.	Sh.	Eg.		11	3		I.	Tr.	In.
	21	58	18.6	II.	Ec.	Dis.		22	16		I.	Tr.	Eg.		12	23		I.	Sh.	Eg.
4	1	46	12.5	I.	Ec.	Dis.	14	13	54	41.4	II.	Ec.	Dis.		13	18		I.	Tr.	Eg.
	1	49		II.	Oc.	Re.		16	37	1.6	I.	Ec.	Dis.	25	5	49	57.4	II.	Ec.	Dis.
	4	33		I.	Oc.	Re.		18	6		II.	Oc.	Re.		7	27	36.6	I.	Ec.	Dis.
	22	55		I.	Sh.	In.		19	34		I.	Oc.	Re.		10	20		II.	Oc.	Re.
	23	30		I.	Tr.	In.	15	13	46		I.	Sh.	In.		10	33		I.	Oc.	Re.
5	1	8		I.	Sh.	Eg.		14	32		I.	Tr.	In.	26	4	38		I.	Sh.	In.
	1	45		I.	Tr.	Eg.		16	0		I.	* Sh.	Eg.		5	33		I.	Tr.	In.
	10	27		III.	Sh.	In.		16	47		I.	Tr.	Eg.		6	52		I.	Sh.	Eg.
	12	39		III.	Sh.	Eg.	16	4	25	33.4	III.	Ec.	Dis.		7	48		I.	Tr.	Eg.
	12	51		III.	Tr.	In.		6	27	29.4	III.	Ec.	Re.		22	26		III.	Sh.	In.
	15	12		III.	Tr.	Eg.		7	23		III.	Oc.	Dis.	27	0	33		II.	Sh.	In.
	16	51		II.	Sh.	In.		8	42		II.	Sh.	In.		0	41		III.	Sh.	Eg.
	18	5		II.	Tr.	In.		9	46		III.	Oc.	Re.		1	56	2.7	I.	Ec.	Dis.
	19	32		II.	Sh.	Eg.		10	17		II.	Tr.	In.		2	6		III.	Tr.	In.
	20	14	43.0	I.	Ec.	Dis.		11	5	28.0	I.	Ec.	Dis.		2	26		II.	Tr.	In.
	20	47		II.	Tr.	Eg.		11	24		II.	Sh.	Eg.		3	15		II.	Sh.	Eg.
	23	3		I.	Oc.	Re.		12	59		II.	Tr.	Eg.		4	30		III.	Tr.	Eg.
6	17	23		I.	Sh.	In.		14	4		I.	Oc.	Re.		5	3		I.	Oc.	Re.
	18	1		I.	Tr.	In.	17	8	15		I.	Sh.	In.		5	8		II.	Tr.	Eg.
	19	37		I.	Sh.	Eg.		9	2		I.	Tr.	In.		23	7		I.	Sh.	In.
	20	15		I.	Tr.	Eg.		10	29		I.	Sh.	Eg.	28	0	3		I.	Tr.	In.
7	11	17	27.1	II.	Ec.	Dis.		11	17		I.	Tr.	Eg.		1	20		I.	Sh.	Eg.
	14	43	11.2	I.	Ec.	Dis.	18	3	12	45.6	II.	Ec.	Dis.		2	18		I.	Tr.	Eg.
	15	15		II.	Oc.	Re.		5	33	53.6	I.	Ec.	Dis.		19	9	5.8	II.	Ec.	Dis.
	17	33		I.	Oc.	Re.		7	30		II.	Oc.	Re.		20	24	27.7	I.	Ec.	Dis.
8	11	52		I.	Sh.	In.		8	34		I.	Oc.	Re.		23	33		I.	Oc.	Re.
	12	31		I.	Tr.	In.	19	2	44		I.	Sh.	In.		23	45		II.	Oc.	Re.
	14	6		I.	Sh.	Eg.		3	32		I.	Tr.	In.	29	17	35		I.	Sh.	In.
	14	46		I.	Tr.	Eg.		4	58		I.	Sh.	Eg.		18	33		I.	Tr.	In.
9	0	26	28.4	III.	Ec.	Dis.		5	47		I.	Tr.	Eg.		19	49		I.	Sh.	Eg.
	2	27	10.2	III.	Ec.	Re.		18	27		III.	Sh.	In.		20	48		I.	Tr.	Eg.
	2	58		III.	Oc.	Dis.		20	42		III.	Sh.	Eg.	30	12	24	17.0	III.	Ec.	Dis.
	5	20		III.	Oc.	Re.		21	43		III.	Tr.	In.		13	50		II.	Sh.	In.
	6	8		II.	Sh.	In.		21	59		II.	Sh.	In.		14	28	43.2	III.*	Ec.	Re.
	7	29		II.	Tr.	In.		23	40		II.	Tr.	In.		14	52	51.4	I.	* Ec.	Dis.
	8	49		II.	Sh.	Eg.	20	0	2	21.0	I.	Ec.	Dis.		15	49		II.	* Tr.	In.
	9	11	39.0	I.	Ec.	Dis.		0	6		III.	Tr.	Eg.		16	10		III.*	Oc.	Dis.
	10	11		II.	Tr.	Eg.		0	41		II.	Sh.	Eg.		16	32		II.	Sh.	Eg.
	12	4		I.	Oc.	Re.		2	22		II.	Tr.	Eg.		18	3		I.	Oc.	Re.
10	6	20		I.	Sh.	In.		3	4		I.	Oc.	Re.		18	31		II.	Tr.	Eg.
	7	1		I.	Tr.	In.		21	12		I.	Sh.	In.		18	34		III.	Oc.	Re.
	8	34		I.	Sh.	Eg.		22	2		I.	Tr.	In.	31	12	4		I.	Sh.	In.
	9	16		I.	Tr.	Eg.		23	26		I.	Sh.	Eg.		13	3		I.	Tr.	In.
11	0	35	32.4	II.	Ec.	Dis.	21	0	17		I.	Tr.	Eg.		14	17		I.	* Sh.	Eg.
	3	40	5.7	I.	Ec.	Dis.		16	31	54.7	II.	Ec.	Dis.		15	18		I.	* Tr.	Eg.
	4	40		II.	Oc.	Re.		18	30	47.1	I.	Ec.	Dis.							

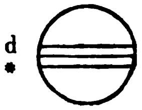
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington

WASHINGTON MEAN TIME.

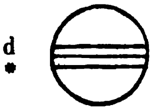
JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

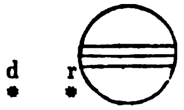
I.



II.



III.



Configurations at 15h for an Inverting Telescope.

Day.	West.		East.
1	·3 1·	○	4· 2·
2	4· 2·	○	·1 ·3
3	4· 1· ·2	○	·3
4	4·	○	1· ·2 3·
5	○ 3· 4· ·1	○	2·
6	·4 3· 2·	○	1·
7	·4 ·3	○	·1 ● ·2 ●
8	·4 ·3 ●1·	○	2·
9	·4 2·	○	·1 ·3
10	·2 1·	○	·4 ·3
11		○	·1 ·2 3· ·4
12	·1	○	3· 2· ·4
13	3· 2·	○	1· ·4
14	·3 ·1	○	4· ·2 ●
15	○ 1· ·3	○	2· 4·
16	2·	○	·1 ·3 4·
17	.2 1·	○	4· ·3
18	4	○	· ·1 ·2 3·
19	4· 1·	○	3· 2·
20	4· 3· 2·	○	1·
21	4· 3· ·1 ·2	○	
22	4. ·3	○	1· ·2
23	○ 2· ·4	○	·3 ·1 ●
24	·4 ·2 1·	○	·3
25	·4	○	·1 ·2 3·
26	1· ·4	○	3· 2·
27	2·3·	○	·41·
28	3· ·1 ·2	○	·4
29	·3	○	1· ·2 ·4
30	2	○	· ·4 ·1 ● ·3 ●
31	○ 1· ·2	○	·3 4·

WASHINGTON MEAN TIME.

AUGUST.

d	h	m	s				d	h	m	s				d	h	m	s			
1	8	27	6.7	II.	Ec.	Dis.	11	6	16		I.	Tr.	Eg.	21	18	59		I.	Tr.	In.
	9	21	14.6	I.	Ec.	Dis.	12	0	11	35.5	I.	Ec.	Dis.		20	0		I.	Sh.	Eg.
	12	32		I.	Oc.	Re.		0	23	18.7	II.	Ec.	Dis.		21	13		I.	Tr.	Eg.
	13	8		II.	Oc.	Re.		3	30		I.	Oc.	Re.	22	15	1	46.5	I.	* Ec.	Dis.
2	6	32		I.	Sh.	In.		5	20		II.	Oc.	Re.		16	18	14.0	II.	* Ec.	Dis.
	7	33		I.	Tr.	In.		21	24		I.	Sh.	In.		18	27		I.	Oc.	Re.
	8	46		I.	Sh.	Eg.		22	32		I.	Tr.	In.		21	27		II.	Oc.	Re.
	9	48		I.	Tr.	Eg.		23	38		I.	Sh.	Eg.	23	12	15		I.	Sh.	In.
3	2	24		III.	Sh.	In.	13	0	46		I.	Tr.	Eg.		13	28		I.	* Tr.	In.
	3	7		II.	Sh.	In.		18	39	57.2	I.	Ec.	Dis.		14	29		I.	* Sh.	Eg.
	3	49	39.3	I.	Ec.	Dis.		18	58		II.	Sh.	In.		15	43		I.	* Tr.	Eg.
	4	41		III.	Sh.	Eg.		20	22	30.2	III.	Ec.	Dis.	24	9	30	8.1	I.	Ec.	Dis.
	5	11		II.	Tr.	In.		21	16		II.	Tr.	In.		10	49		II.	Sh.	In.
	5	49		II.	Sh.	Eg.		21	40		II.	Sh.	Eg.		12	56		I.	Oc.	Re.
	6	26		III.	Tr.	In.		22	0		I.	Oc.	Re.		13	19		II.	* Tr.	In.
	7	2		I.	Oc.	Re.		22	29	29.2	III.	Ec.	Re.		13	31		II.	* Sh.	Eg.
	7	54		II.	Tr.	Eg.		23	59		II.	Tr.	Eg.		14	23		III.	* Sh.	In.
	8	51		III.	Tr.	Eg.	14	0	48		III.	Oc.	Dis.		16	2		II.	* Tr.	Eg.
4	1	1		I.	Sh.	In.		3	15		III.	Oc.	Re.		16	43		III.	Sh.	Eg.
	2	3		I.	Tr.	In.		15	53		I.	* Sh.	In.		19	17		III.	Tr.	In.
	3	15		I.	Sh.	Eg.		17	1		I.	Tr.	In.		21	45		III.	Tr.	Eg.
	4	18		I.	Tr.	Eg.		18	7		I.	Sh.	Eg.	25	6	43		I.	Sh.	In.
	21	46	13.9	II.	Ec.	Dis.		19	15		I.	Tr.	Eg.		7	57		I.	Tr.	In.
	22	18	3.4	I.	Ec.	Dis.	15	13	8	18.9	I.	Ec.	Dis.		8	57		I.	Sh.	Eg.
5	1	32		I.	Oc.	Re.		13	41	15.8	II.	* Ec.	Dis.		10	12		I.	Tr.	Eg.
	2	33		II.	Oc.	Re.		16	29		I.	* Oc.	Re.	26	3	58	30.6	I.	Ec.	Dis.
	19	30		I.	Sh.	In.		18	42		II.	Oc.	Re.		5	37	14.1	II.	Ec.	Dis.
	20	32		I.	Tr.	In.	16	10	21		I.	Sh.	In.		7	25		I.	Oc.	Re.
	21	43		I.	Sh.	Eg.		11	31		I.	Tr.	In.		10	49		II.	Oc.	Re.
	22	47		I.	Tr.	Eg.		12	35		I.	Sh.	Eg.	27	1	12		I.	Sh.	In.
6	16	23	44.4	III.	Ec.	Dis.		13	45		I.	* Tr.	Eg.		2	27		I.	Tr.	In.
	16	24		II.	Sh.	In.	17	7	36	41.4	I.	Ec.	Dis.		3	26		I.	Sh.	Eg.
	16	46	26.1	I.	Ec.	Dis.		8	15		II.	Sh.	In.		4	41		I.	Tr.	Eg.
	18	29	26.8	III.	Ec.	Re.		10	24		III.	Sh.	In.		22	26	50.8	I.	Ec.	Dis.
	18	33		II.	Tr.	In.		10	37		II.	Tr.	In.	28	0	6		II.	Sh.	In.
	19	6		II.	Sh.	Eg.		10	57		II.	Sh.	Eg.		1	54		I.	Oc.	Re.
	20	2		I.	Oc.	Re.		10	59		I.	Oc.	Re.		2	39		II.	Tr.	In.
	20	30		III.	Oc.	Dis.		12	43		III.	Sh.	Eg.		2	48		II.	Sh.	Eg.
	21	16		II.	Tr.	Eg.		13	20		II.	* Tr.	Eg.		4	19	33.7	III.	Ec.	Dis.
	22	56		III.	Oc.	Re.		15	3		III.	* Tr.	In.		5	22		II.	Tr.	Eg.
7	13	58		I.	* Sh.	In.		17	30		III.	Tr.	Eg.		6	29	7.1	III.	Ec.	Re.
	15	2		I.	* Tr.	In.	18	4	50		I.	Sh.	In.		9	15		III.	Oc.	Dis.
	16	12		I.	* Sh.	Eg.		6	0		I.	Tr.	In.		11	44		III.	Oc.	Re.
	17	17		I.	Tr.	Eg.		7	4		I.	Sh.	Eg.		19	40		I.	Sh.	In.
8	11	4	13.1	II.	Ec.	Dis.		8	14		I.	Tr.	Eg.		20	56		I.	Tr.	In.
	11	14	48.5	I.	Ec.	Dis.	19	2	5	4.4	I.	Ec.	Dis.		21	54		I.	Sh.	Eg.
	14	31		I.	* Oc.	Re.		3	0	18.9	II.	Ec.	Dis.		23	11		I.	Tr.	Eg.
	15	56		II.	* Oc.	Re.		5	28		I.	Oc.	Re.	29	16	55	11.5	I.	Ec.	Dis.
9	8	27		I.	Sh.	In.		8	5		II.	Oc.	Re.		18	55	7.2	II.	Ec.	Dis.
	9	32		I.	Tr.	In.		23	18		I.	Sh.	In.		20	23		I.	Oc.	Re.
	10	41		I.	Sh.	Eg.	20	0	29		I.	Tr.	In.	30	0	10		II.	Oc	Re.
	11	47		I.	Tr.	Eg.		1	32		I.	Sh.	Eg.		14	9		I.	* Sh.	In.
10	5	41		II.	Sh.	In.		2	44		I.	Tr.	Eg.		15	25		I.	* Tr.	In.
	5	43	12.1	I.	Ec.	Dis.		20	33	25.3	I.	Ec.	Dis.		16	23		I.	* Sh.	Eg.
	6	24		III.	Sh.	In.		21	32		II.	Sh.	In.		17	40		I.	Tr	Eg.
	7	55		II.	Tr.	In.		23	57		I.	Oc.	Re.	31	11	23	32.4	I.	Ec.	Dis.
	8	23		II.	Sh.	Eg.		23	58		II.	Tr.	In.		13	23		II.	* Sh.	In.
	8	42		III.	Sh.	Eg.	21	0	14		II.	Sh.	Eg.		14	52		I.	* Oc.	Re.
	9	1		I.	Oc.	Re.		0	21	4.3	III.	Ec.	Dis.		15	59		II.	* Tr.	In.
	10	38		II.	Tr.	Eg.		2	29	20.3	III.	Ec.	Re.		16	5		II.	* Sh.	Eg.
	10	45		III.	Tr.	In.		2	41		II.	Tr.	Eg.		18	23		III.	Sh.	In.
	13	12		III.	Tr.	Eg.		5	3		III.	Oc.	Dis.		18	42		II.	Tr.	Eg.
11	2	56		I.	Sh.	In.		7	31		III.	Oc.	Re.		20	45		III.	Sh.	Eg.
	4	2		I.	Tr.	In.		17	47		I.	Sh.	In.		23	29		III.	Tr.	In.
	5	10		I.	Sh.	Eg.														

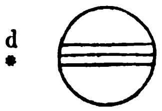
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

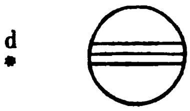
AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

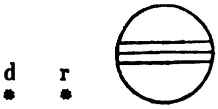
I.



II.



III.



Configurations at 14h 30m for an Inverting Telescope.

Day.	West.		East.
1		○	·1 ·2 3· 4·
2	1·	○	3· 2· 4·
3	2· 3·	○	·1 4·
4	3· ·2·1 4	○	·
5	·3 4·	○	1· ·2
6	4· ·1 ·3	○	2·
7	4· 2·	○	1· ·3
8	4·	○	·3 ·1 ● ·2 ●
9	·4 1·	○	2· 3·
10	·4 2· 3·	○	·1
11	·43· ·21·	○	
12	·3 ·4	○	1· ·2
13	·3 ·1	○	2· ·4
14	2·	○	1· ·3 ·4
15		○	·3 ·4 ·1 ● ·2 ●
16	1·	○	·2 3· ·4
17	2·	③	· ·1 4·
18	3· ·2 1·	○	4·
19	·3	○	·1 ·2 4·
20	·3 ·1	○	2· 4·
21	2· 4·	○	1· ·3
22	4· 2· ·1	○	·3
23	○ 1· 4·	○	·2 3·
24	○ 2· 4·	○	3· ·1
25	4· 3· ·2 1·	○	
26	·4 3·	○	·21·
27	·4 ·3 ·1	○	2·
28	·4 2·	○	·3 1·
29	·2 ·1 ·4	○	·3
30		○	1· ·4 ·2 3·
31		○	2· 3· ·4 ·1 ●

WASHINGTON MEAN TIME.

SEPTEMBER.

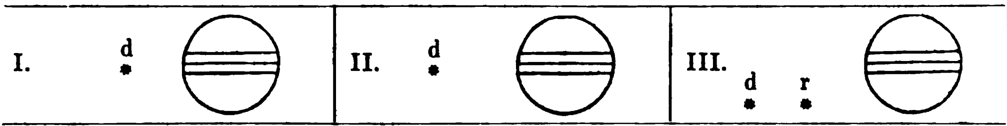
d	h	m	s				d	h	m	s				d	h	m	s			
1	1	58		III.	Tr.	Eg.	11	10	39		II.	Tr.	Eg.	21	17	3	39.1	I. *	Ec.	Dis.
	8	37		I.	Sh.	In.		12	17	16.7	III.*	Ec.	Dis.		20	37		I.	Oc.	Re.
	9	54		I.	Tr.	In.		14	29	25.7	III.*	Ec.	Re.		21	5		II.	Sh.	In.
	10	51		I.	Sh.	Eg.		17	30		III.	Oc.	Dis.		23	47		II.	Sh.	Eg.
	12	9		I.	Tr.	Eg.		20	1		III.	Oc.	Re.		23	49		II.	Tr.	In.
2	5	51	54.7	I.	Ec.	Dis.		23	28		I.	Sh.	In.	22	2	32		II.	Tr.	Eg.
	8	14	4.0	II.	Ec.	Dis.	12	0	48		I.	Tr.	In.		6	19		III.	Sh.	In.
	9	21		I.	Oc.	Re.		1	43		I.	Sh.	Eg.		8	44		III.	Sh.	Eg.
	13	32		II. *	Oc.	Re.		3	3		I.	Tr.	Eg.		11	40		III.*	Tr.	In.
3	3	6		I.	Sh.	In.		20	41	57.2	I.	Ec.	Dis.		14	13		III.*	Tr.	Eg.
	4	23		I.	Tr.	In.	13	0	8	36.5	II.	Ec.	Dis.		14	20		I. *	Sh.	In.
	5	20		I.	Sh.	Eg.		0	14		I.	Oc.	Re.		15	40		I. *	Tr.	In.
	6	38		I.	Tr.	Eg.		5	32		II.	Oc.	Re.		16	34		I. *	Sh.	Eg.
4	0	20	14.4	I.	Ec.	Dis.		17	57		I.	Sh.	In.		17	55		I.	Tr.	Eg.
	2	40		II.	Sh.	In.		19	17		I.	Tr.	In.	23	11	32	1.9	I. *	Ec.	Dis.
	3	50		I.	Oc.	Re.		20	11		I.	Sh.	Eg.		15	5		I. *	Oc.	Re.
	5	18		II.	Tr.	In.		21	32		I.	Tr.	Eg.		16	3	55.7	II. *	Ec.	Dis.
	5	22		II.	Sh.	Eg.	14	15	10	17.1	I. *	Ec.	Dis.		21	28		II.	Oc.	Re.
	8	1		II.	Tr.	Eg.		18	31		II.	Sh.	In.	24	8	48		I.	Sh.	In.
	8	18	8.2	III.	Ec.	Dis.		18	43		I.	Oc.	Re.		10	8		I.	Tr.	In.
	10	28	59.2	III.	Ec.	Re.		21	13		II.	Sh.	Eg.		11	3		I.	Sh.	Eg.
	13	25		III.*	Oc.	Dis.		21	14		II.	Tr.	In.		12	23		I. *	Tr.	Eg.
	15	54		III.*	Oc.	Re.		23	57		II.	Tr.	Eg.	25	6	0	21.1	I.	Ec.	Dis.
	21	34		I.	Sh.	In.	15	2	20		III.	Sh.	In.		9	33		I.	Oc.	Re.
	22	52		I.	Tr.	In.		4	44		III.	Sh.	Eg.		10	22		II.	Sh.	In.
	23	48		I.	Sh.	Eg.		7	40		III.	Tr.	In.		13	4		II. *	Sh.	Eg.
5	1	7		I.	Tr.	Eg.		10	12		III.	Tr.	Eg.		13	5		II. *	Tr.	In.
	18	48	34.9	I.	Ec.	Dis.		12	26		I. *	Sh.	In.		15	48		II. *	Tr.	Eg.
	21	31	54.7	II.	Ec.	Dis.		13	46		I. *	Tr.	In.		20	15	9.6	III.	Ec.	Dis.
	22	19		I.	Oc.	Re.		14	40		I. *	Sh.	Eg.		22	29	54.8	III.	Ec.	Re.
6	2	52		II.	Oc.	Re.		16	1		I. *	Tr.	Eg.	26	1	31		III.	Oc.	Dis.
	16	3		I. *	Sh.	In.	16	9	38	39.6	I.	Ec.	Dis.		3	17		I.	Sh.	In.
	17	21		I.	Tr.	In.		13	11		I. *	Oc.	Re.		4	5		III.	Oc.	Re.
	18	17		I.	Sh.	Eg.		13	27	24.8	II. *	Ec.	Dis.		4	36		I.	Tr.	In.
	19	36		I.	Tr.	Eg.		18	52		II.	Oc.	Re.		5	31		I.	Sh.	Eg.
7	13	16	55.2	I. *	Ec.	Dis.	17	6	54		I.	Sh.	In.		6	52		I.	Tr.	Eg.
	15	57		II. *	Sh.	In.		8	14		I.	Tr.	In.	27	0	28	42.0	I.	Ec.	Dis.
	16	48		I. *	Oc.	Re.		9	9		I.	Sh.	Eg.		4	1		I.	Oc.	Re.
	18	37		II.	Tr.	In.		10	30		I.	Tr.	Eg.		5	21	40.0	II.	Ec.	Dis.
	18	39		II.	Sh.	Eg.	18	4	6	58.7	I.	Ec.	Dis.		10	45		II.	Oc.	Re.
	21	20		II.	Tr.	Eg.		7	40		I.	Oc.	Re.		21	45		I.	Sh.	In.
	22	21		III.	Sh.	In.		7	48		II.	Sh.	In.		23	5		I.	Tr.	In.
8	0	44		III.	Sh.	Eg.		10	30		II.	Sh.	Eg.	28	0	0		I.	Sh.	Eg.
	3	37		III.	Tr.	In.		10	32		II.	Tr.	In.		1	20		I.	Tr.	Eg.
	6	7		III.	Tr.	Eg.		13	15		II. *	Tr.	Eg.		18	57	1.9	I.	Ec.	Dis.
	10	31		I.	Sh.	In.		16	16	2.8	III.*	Ec.	Dis.		22	29		I.	Oc.	Re.
	11	50		I.	Tr.	In.		18	29	29.8	III.	Ec.	Re.		23	39		II.	Sh.	In.
	12	45		I. *	Sh.	Eg.		21	33		III.	Oc.	Dis.	29	2	21		II.	Sh.	Eg.
	14	5		I. *	Tr.	Eg.	19	0	4		III.	Oc.	Re.		2	21		II.	Tr.	In.
9	7	45	17.4	I.	Ec.	Dis.		1	23		I.	Sh.	In.		5	4		II.	Tr.	Eg.
	10	50	47.6	II.	Ec.	Dis.		2	43		I.	Tr.	In.		10	17		III.	Sh.	In.
	11	17		I.	Oc.	Re.		3	37		I.	Sh.	Eg.		12	44		III.*	Sh.	Eg.
	16	13		II. *	Oc.	Re.		4	58		I.	Tr.	Eg.		15	37		III.*	Tr.	In.
10	5	0		I.	Sh.	In.		22	35	19.4	I.	Ec.	Dis.		16	13		I. *	Sh.	In.
	6	19		I.	Tr.	In.	20	2	8		I.	Oc.	Re.		17	33		I. *	Tr.	In.
	7	14		I.	Sh.	Eg.		2	45	11.4	II.	Ec.	Dis.		18	10		III.	Tr.	Eg.
	8	34		I.	Tr.	Eg.		8	10		II.	Oc.	Re.		18	28		I.	Sh.	Eg.
11	2	13	36.8	I.	Ec.	Dis.		19	51		I.	Sh.	In.		19	48		I.	Tr.	Eg.
	5	14		II.	Sh.	In.		21	11		I.	Tr.	In.	30	13	25	25.2	I. *	Ec.	Dis.
	5	45		I.	Oc.	Re.		22	6		I.	Sh.	Eg.		16	58		I. *	Oc.	Re.
	7	56		II.	Sh.	Eg.		23	26		I.	Tr.	Eg.		18	40	18.9	II.	Ec.	Dis.
	7	56		II.	Tr.	In.														

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 14h for an Inverting Telescope.

Day.	West.		East.
1	2· 3· 1·	○	·4
2	3·	○	·2 ·1 ·4
3	·3 1·	○	2· 4·
4	2·	○	1· 4· ·3 ●
5	·2 ·1	○	·3 4·
6		○	1· 4· ·2 3·
7	4·	○	2· 3· ·1 ●
8	○ 1· 4· 2· 3·	○	
9	4· 3·	○	1· ·2 ●
10	4· ·3 1·	○	2·
11	·4 2·	○	·1 ·3 ●
12	·4 ·2 ·1	○	·3
13	·4	○	1· ·2 3·
14	·4 ·1	○	2· 3·
15	○ 1· 2· 3·	·○4	
16	3·	○	·1 ·4 ·2 ●
17	3· 1·	○	·2 ·4
18	·3 2·	○	·1 ·4
19	·2 1·	○	·3 ·4
20		○	1· 2 ·3 4·
21	·1	○	2· 3· 4·
22	○ 3· 2·	○	1· 4·
23	3· ·2	○	4· ·1 ●
24	·3 4· 1·	○	·2
25	○ 2· 4· ·3	○	· ·1
26	4· ·2 1·	○	·3
27	4·	○	·2 1· ·3
28	·4 ·1	○	2· 3·
29	·4 2·	3○·	1·
30	·4 3· ·2	○	·1 ●

WASHINGTON MEAN TIME.

OCTOBER.

d	h	m	s				
1	0	3		II.		Oc.	Re.
	10	42		I.	*	Sh.	In.
	12	1		I.	*	Tr.	In.
	12	56		I.	*	Sh.	Eg.
	14	16		I.	*	Tr.	Eg.
2	7	53	44.8	I.		Ec.	Dis.
	11	25		I.	*	Oc.	Re.
	12	56		II.	*	Sh.	In.
	15	37		II.	*	Tr.	In.
	15	38		II.	*	Sh.	Eg.
	18	20		II.		Tr.	Eg.
3	0	13	40.1	III.		Ec.	Dis.
	2	29	43.7	III.		Ec.	Re.
	5	10		I.		Sh.	In.
	5	25		III.		Oc.	Dis.
	6	29		I.		Tr.	In.
	7	24		I.		Sh.	Eg.
	7	58		III.		Oc.	Re.
	8	44		I.		Tr.	Eg.
4	2	22	6.3	I.		Ec.	Dis.
	5	53		I.		Oc.	Re.
	7	58	1.8	II.		Ec.	Dis.
	13	19		II.	*	Oc.	Re.
	23	39		I.		Sh.	In.
5	0	57		I.		Tr.	In.
	1	53		I.		Sh.	Eg.
	3	12		I.		Tr.	Eg.
	20	50	26.4	I.		Ec.	Dis.
6	0	21		I.		Oc.	Re.
	2	13		II.		Sh.	In.
	4	52		II.		Tr.	In.
	4	56		II.		Sh.	Eg.
	7	35		II.		Tr.	Eg.
	14	17		III.	*	Sh.	In.
	16	44		III.	*	Sh.	Eg.
	18	7		I.		Sh.	In.
	19	25		I.		Tr.	In.
	19	29		III.		Tr.	In.
	20	21		I.		Sh.	Eg.
	21	40		I.		Tr.	Eg.
	22	3		III.		Tr.	Eg.
7	15	18	50.3	I.	*	Ec.	Dis.
	18	49		I.		Oc.	Re.
	21	16	35.8	II.		Ec.	Dis.
8	2	35		II.		Oc.	Re.
	12	36		I.	*	Sh.	In.
	13	53		I.	*	Tr.	In.
	14	50		I.	*	Sh.	Eg.
	16	8		I.	*	Tr.	Eg.
9	9	47	10.5	I.		Ec.	Dis.
	13	17		I.	*	Oc.	Re.
	15	30		II.	*	Sh.	In.
	18	6		II.		Tr.	In.
	18	13		II.		Sh.	Eg.
	20	49		II.		Tr.	Eg.
10	4	12	4.1	III.		Ec.	Dis.
	6	29	26.3	III.		Ec.	Re.
	7	4		I.		Sh.	In.
	8	21		I.		Tr.	In.
	9	14		III.		Oc.	Dis.
	9	18		I.		Sh.	Eg.
	10	36		I.	*	Tr.	Eg.
	11	48		III.	*	Oc.	Re.
11	4	15	32.6	I.		Ec.	Dis.
	7	44		I.		Oc.	Re.
11	10	34	17.0	II.	*	Ec.	Dis.
	15	50		II.	*	Oc.	Re.
12	1	33		I.		Sh.	In.
	2	48		I.		Tr.	In.
	3	47		I.		Sh.	Eg.
	5	3		I.		Tr.	Eg.
	22	43	53.3	I.		Ec.	Dis.
13	2	12		I.		Oc.	Re.
	4	47		II.		Sh.	In.
	7	20		II.		Tr.	In.
	7	30		II.		Sh.	Eg.
	10	3		II.	*	Tr.	Eg.
	18	16		III.		Sh.	In.
	20	1		I.		Sh.	In.
	20	45		III.		Sh.	Eg.
	21	16		I.		Tr.	[illegible]
	22	15		I.		Sh.	Eg.
	23	17		III.		Tr.	In.
	23	31		I.		Tr.	Eg.
14	1	51		III.		Tr.	Eg.
	17	12	18.2	I.	*	Ec.	Dis.
	20	40		I.		Oc.	Re.
	23	52	45.7	II.		Ec.	Dis.
15	5	4		II.		Oc.	Re.
	14	30		I.	*	Sh.	In.
	15	44		I.	*	Tr.	In.
	16	44		I.	*	Sh.	Eg.
	17	59		I.	*	Tr.	Eg.
16	11	40	39.0	I.	*	Ec.	Dis.
	15	7		I.	*	Oc.	Re.
	18	4		II.		Sh.	In.
	20	33		II.		Tr.	In.
	20	47		II.		Sh.	Eg.
	23	16		II.		Tr.	Eg.
17	8	10	31.1	III.		Ec.	Dis.
	8	58		I.		Sh.	In.
	10	12		I.	*	Tr.	In.
	10	29	11.9	III.	*	Ec.	Re.
	11	13		I.	*	Sh.	Eg.
	12	27		I.	*	Tr.	Eg.
	12	59		III.	*	Oc.	Dis.
	15	33		III.	*	Oc.	Re.
18	6	9	2.2	I.		Ec.	Dis.
	9	34		I.		Oc.	Re.
	13	10	25.3	II.	*	Ec.	Dis.
	18	18		II.		Oc.	Re.
19	3	26		I.		Sh.	In.
	4	39		I.		Tr.	In.
	5	41		I.		Sh.	Eg.
	6	54		I.		Tr.	Eg.
20	0	37	23.5	I.		Ec.	Dis.
	4	2		I.		Oc.	Re.
	7	21		II.		Sh.	In.
	9	46		II.	*	Tr.	In.
	10	5		II.	*	Sh.	Eg.
	12	29		II.	*	Tr.	Eg.
	21	55		I.		Sh.	In.
	22	15		III.		Sh.	In.
	23	6		I.		Tr.	In.
21	0	10		I.		Sh.	Eg.
	0	45		III.		Sh.	Eg.
	1	21		I.		Tr.	Eg.
	2	59		III.		Tr.	In.
	5	34		III.		Tr.	Eg.
	19	5	49.4	I.		Ec.	Dis.
21	22	29		I.		Oc.	Re.
22	2	28	48.9	II.		Ec.	Dis.
	7	32		II.		Oc.	Re.
	16	23		I.	*	Sh.	In.
	17	33		I.		Tr.	In.
	18	38		I.		Sh.	Eg.
	19	48		I.		Tr.	Eg.
23	13	34	11.4	I.	*	Ec.	Dis.
	16	56		I.	*	Oc.	Re.
	20	38		II.		Sh.	In.
	22	58		II.		Tr.	In.
	23	22		II.		Sh.	Eg.
24	1	41		II.		Tr.	Eg.
	10	52		I.	*	Sh.	In.
	12	0		I.	*	Tr.	In.
	12	9	8.7	III.	*	Ec.	Dis.
	13	6		I.	*	Sh.	Eg.
	14	15		I.	*	Tr.	Eg.
	14	29	8.1	III.	*	Ec.	Re.
	16	39		III.	*	Oc.	Dis.
	19	13		III.		Oc.	Re.
25	8	2	35.7	I.		Ec.	Dis.
	11	23		I.	*	Oc.	Re.
	15	46	27.4	II.	*	Ec.	Dis.
	20	44		II.		Oc.	Re.
26	5	20		I.		Sh.	In.
	6	27		I.		Tr.	In.
	7	35		I.		Sh.	Eg.
	8	42		I.		Tr.	Eg.
27	2	30	58.0	I.		Ec.	Dis.
	5	50		I.		Oc.	Re.
	9	56		II.	*	Sh.	In.
	12	10		II.	*	Tr.	In.
	12	40		II.	*	Sh.	Eg.
	14	53		II.	*	Tr.	Eg.
	23	49		I.		Sh.	In.
28	0	54		I.		Tr.	In.
	2	3		I.		Sh.	Eg.
	2	14		III.		Sh.	In.
	3	9		I.		Tr.	Eg.
	4	45		III.		Sh.	Eg.
	6	37		III.		Tr.	In.
	9	12		III.	*	Tr.	Eg.
	20	59	25.4	I.		Ec.	Dis.
29	0	17		I.		Oc.	Re.
	5	4	45.9	II.		Ec.	Dis.
	9	56		II.	*	Oc.	Re.
	18	17		I.		Sh.	In.
	19	21		I.		Tr.	In.
	20	32		I.		Sh.	Eg.
	21	36		I.		Tr.	Eg.
30	15	27	48.6	I.	*	Ec.	Dis.
	18	44		I.		Oc.	Re.
	23	13		II.		Sh.	In.
31	1	22		II.		Tr.	In.
	1	57		II.		Sh.	Eg.
	4	4		II.		Tr.	Eg.
	12	46		I.	*	Sh.	In.
	13	48		I.	*	Tr.	In.
	15	0		I.	*	Sh.	Eg.
	16	3		I.	*	Tr.	Eg.
	16	8	26.4	III.	*	Ec.	Dis.
	18	29	44.4	III.		Ec.	Re.
	20	15		III.		Oc.	Dis.
	22	49		III.		Oc.	Re.

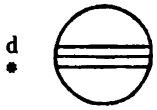
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

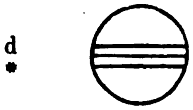
OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

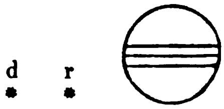
I.



II.



III.



Configurations at 13h 30m for an Inverting Telescope.

Day.	West.		East.
1	○ 1· ·3 ·4	○	·2
2	·3	○	·4 2· ·1
3	2· 1·	○	·3 ·4
4		○	·2 ·1 ·3 ·4
5	·1	○	2· 3· ·4
6	2·	○	3· 1· ·4
7	3· ·2 ·1	○	4·
8	3·	○	1· ·2 4·
9	·3	○	·1 2· 4·
10	2· 1·	○	4· ·3
11	4·	○	·1 ·3 ·2 ●
12	4. 1·	○	2· 3·
13	4· 2·	○	3· 1·
14	4· 3· ·2 ·1	○	
15	·4 3·	○	1· ·2
16	·4 ·3	○	2· ·1 ●
17	·4 2. 1·	○	·3 ●
18	·4	○	·1 ·3 ·2 ●
19	1·	○	·4 ·2 3·
20	2·	○	1· 3· ·4
21	·2 3· ·1	○	·4
22	3·	○	1· ·2 ·4
23	·3 ·1	○	2· 4·
24	○ 1· 2·	○	4· ·3 ●
25	·2	○	·1 ·3 4·
26	1·	○	4· ·2 3·
27	○ 2· 4·	○	·1 3·
28	4· ·2 ·1 3·	○	
29	4· 3·	○	·21·
30	4· ·3 ·1	○	2·
31	4· 2· ·3 1	○	·

WASHINGTON MEAN TIME.

NOVEMBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	9	56	14.7	I. *	Ec.	Dis.	11	6	44		I.	Tr.	Eg.	21	9	42		II. *	Sh.	Eg.
	13	11		I. *	Oc.	Re.		10	12		III.*	Sh.	In.		11	1		II. *	Tr.	Eg.
	18	22	23.6	II.	Ec.	Dis.		12	45		III.*	Sh.	Eg.		18	27		I. *	Sh.	In.
	23	8		II.	Oc.	Re.		13	38		III.*	Tr.	In.		19	6		I.	Tr.	In.
2	7	14		I.	Sh.	In.		16	13		III.*	Tr.	Eg.		20	43		I.	Sh.	Eg.
	8	15		I.	Tr.	In.	12	0	46	55.6	I.	Ec.	Dis.		21	22		I.	Tr.	Eg.
	9	29		I. *	Sh.	Eg.		3	51		I.	Oc.	Re.	22	4	5	47.6	III.	Ec.	Dis.
	10	30		I. *	Tr.	Eg.		10	16	23.6	II. *	Ec.	Dis.		6	31	1.0	III.	Ec.	Re.
3	4	24	38.4	I.	Ec.	Dis.		14	39		II. *	Oc.	Re.		6	34		III.	Oc.	Dis.
	7	38		I.	Oc.	Re.		22	5		I.	Sh.	In.		9	9		III.*	Oc.	Re.
	12	31		II. *	Sh.	In.		22	55		I.	Tr.	In.		15	37	51.2	I. *	Ec.	Dis.
	14	33		II. *	Tr.	In.	13	0	20		I.	Sh.	Eg.		18	28		I. *	Oc.	Re.
	15	14		II. *	Sh.	Eg.		1	10		I.	Tr.	Eg.	23	2	9	42.7	II.	Ec.	Dis.
	17	15		II. *	Tr.	Eg.		19	15	22.0	I.	Ec.	Dis.		6	4		II.	Oc.	Re.
4	1	43		I.	Sh.	In.		22	17		I.	Oc.	Re.		12	56		I. *	Sh.	In.
	2	42		I.	Tr.	In.	14	4	23		II.	Sh.	In.		13	32		I. *	Tr.	In.
	3	57		I.	Sh.	Eg.		6	1		II.	Tr.	In.		15	12		I. *	Sh.	Eg.
	4	57		I.	Tr.	Eg.		7	7		II.	Sh.	Eg.		15	48		I. *	Tr.	Eg.
	6	13		III.	Sh.	In.		8	44		II. *	Tr.	Eg.	24	10	6	19.8	I. *	Ec.	Dis.
	8	45		III.*	Sh.	Eg.		16	34		I. *	Sh.	In.		12	54		I. *	Oc.	Re.
	10	10		III.*	Tr.	In.		17	22		I. *	Tr.	In.		20	16		II.	Sh.	In.
	12	45		III.*	Tr.	Eg.		18	49		I.	Sh.	Eg.		21	25		II.	Tr.	In.
	22	53	7.4	I.	Ec.	Dis.		19	37		I.	Tr.	Eg.		23	0		II.	Sh.	Eg.
5	2	4		I.	Oc.	Re.	15	0	6	51.4	III.	Ec.	Dis.	25	0	9		II.	Tr.	Eg.
	7	40	37.1	II.	Ec.	Dis.		2	30	46.4	III.	Ec.	Re.		7	24		I. *	Sh.	In.
	12	19		II. *	Oc.	Re.		3	12		III.	Oc.	Dis.		7	58		I. *	Tr.	In.
	20	11		I.	Sh.	In.		5	47		III.	Oc.	Re.		9	40		I. *	Sh.	Eg.
	21	9		I.	Tr.	In.		13	43	51.8	I. *	Ec.	Dis.		10	14		I. *	Tr.	Eg.
	22	26		I.	Sh.	Eg.		16	43		I. *	Oc.	Re.		18	10		III.*	Sh.	In.
	23	24		I.	Tr.	Eg.		23	34	0.7	II.	Ec.	Dis.		20	23		III.	Tr.	In.
6	17	21	32.0	I. *	Ec.	Dis.	16	3	47		II.	Oc.	Re.		20	46		III.	Sh.	Eg.
	20	31		I.	Oc.	Re.		11	2		I. *	Sh.	In.		22	59		III.	Tr.	Eg.
7	1	48		II.	Sh.	In.		11	48		I. *	Tr.	In.	26	4	34	54.7	I.	Ec.	Dis.
	3	43		II.	Tr.	In.		13	17		I. *	Sh.	Eg.		7	20		I. *	Oc.	Re.
	4	31		II.	Sh.	Eg.		14	4		I. *	Tr.	Eg.		15	27	43.2	II. *	Ec.	Dis.
	6	25		II.	Tr.	Eg.	17	8	12	18.4	I. *	Ec.	Dis.		19	12		II.	Oc.	Re.
	14	40		I. *	Sh.	In.		11	10		I. *	Oc.	Re.	27	1	53		I.	Sh.	In.
	15	36		I. *	Tr.	In.		17	41		II. *	Sh.	In.		2	24		I.	Tr.	In.
	16	54		I. *	Sh.	Eg.		19	9		II.	Tr.	In.		4	9		I.	Sh.	Eg.
	17	50		I. *	Tr.	Eg.		20	25		II.	Sh.	Eg.		4	40		I.	Tr.	Eg.
	20	7	25.8	III.	Ec.	Dis.		21	53		II.	Tr.	Eg.		23	3	25.1	I.	Ec.	Dis.
	22	30	2.4	III.	Ec.	Re.	18	5	30		I.	Sh.	In.	28	1	46		I.	Oc.	Re.
	23	45		III.	Oc.	Dis.		6	14		I.	Tr.	In.		9	34		II. *	Sh.	In.
8	2	20		III.	Oc.	Re.		7	46		I. *	Sh.	Eg.		10	33		II. *	Tr.	In.
	11	49	59.9	I. *	Ec.	Dis.		8	30		I. *	Tr.	Eg.		12	18		II. *	Sh.	Eg.
	14	58		I. *	Oc.	Re.		14	10		III.*	Sh.	In.		13	17		II. *	Tr.	Eg.
	20	58	14.5	II.	Ec.	Dis.		16	45		III.*	Sh.	Eg.		20	22		I.	Sh.	In.
9	1	29		II.	Oc.	Re.		17	2		III.*	Tr.	In.		20	50		I.	Tr.	In.
	9	8		I. *	Sh.	In.		19	37		III.	Tr.	Eg.		22	37		I.	Sh.	Eg.
	10	2		I. *	Tr.	In.	19	2	40	51.1	I.	Ec.	Dis.		23	6		I.	Tr.	Eg.
	11	23		I. *	Sh.	Eg.		5	36		I.	Oc.	Re.	29	8	4	42.9	III.*	Ec.	Dis.
	12	17		I. *	Tr.	Eg.		12	52	5.4	II. *	Ec.	Dis.		12	28		III.*	Oc.	Re.
10	6	18	24.8	I.	Ec.	Dis.		16	56		II. *	Oc.	Re.		17	31	59.4	I. *	Ec.	Dis.
	9	24		I. *	Oc.	Re.		23	59		I.	Sh.	In.		20	12		I.	Oc.	Re.
	15	6		II. *	Sh.	In.	20	0	40		I.	Tr.	In.	30	4	45	20.7	II.	Ec.	Dis.
	16	52		II. *	Tr.	In.		2	14		I.	Sh.	Eg.		8	20		II. *	Oc.	Re.
	17	49		II. *	Sh.	Eg.		2	56		I.	Tr.	Eg.		14	50		I. *	Sh.	In.
	19	35		II.	Tr.	Eg.		21	9	19.4	I.	Ec.	Dis.		15	16		I. *	Tr.	In.
11	3	37		I.	Sh.	In.	21	0	1		I.	Oc.	Re.		17	6		I. *	Sh.	Eg.
	4	29		I.	Tr.	In.		6	58		II.	Sh.	In.		17	32		I. *	Tr.	Eg.
	5	51		I.	Sh.	Eg.		8	17		II. *	Tr.	In.							

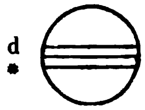
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

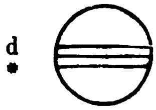
NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

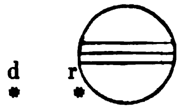
I.



II.



III.



Configurations at 13^h for an Inverting Telescope.

Day.	West.		East.
1	·4 ·2	○	·3 ·1 ●
2	·4 1·	○	·2 ·3
3	·4	○	2· ·1 3·
4	2· 1· ·4 3·	○	
5	3·	○	·2 1· ·4
6	·3 ·1	○	2· ·4
7	2· ·3	○	1· ·4
8	·2	○	·3 ·4 ·1 ●
9	1·	○	·2 ·3 4·
10		○	2· ·1 3· 4·
11	2· 1· 3	○·	4·
12	3·	○	4· ·1 ·2 ●
13	·3 ·14·	○	2·
14	4· ·3 2·	○	1·
15	4· ·2 ·1	○	·3
16	○ 1. 4·	○	·2 ·3
17	·4	○	·1 2· 3·
18	·4 2· 1·	○	3·
19	·4 3·	○	·1 ·2 ●
20	·3 ·4 ·1	○	2·
21	·3 2·	○	·4 1·
22	·2 ·1	○	·3 ·4
23		○	1· ·2 ·3 ·4
24		○	·1 2· 3· ·4
25	2· 1·	○	3· ·4
26	3· ·2	○	·1 4·
27	3· 1·	○	·2 4·
28	○ 2· ·3	○	1· 4·
29	·2 ·1	○	4· ·3
30	4·	○	1· ·2 ·3

WASHINGTON MEAN TIME.

DECEMBER.

d	h	m	s			
1	12	0	30.0	I. *	Ec.	Dis.
	14	38		I. *	Oc.	Re.
	22	52		II.	Sh.	In.
	23	41		II.	Tr.	In.
2	1	33		II.	Sh.	Eg.
	2	24		II.	Tr.	Eg.
	9	19		I. *	Sh.	In.
	9	42		I. *	Tr.	In.
	11	34		I. *	Sh.	Eg.
	11	58		I. *	Tr.	Eg.
	22	9		III.	Sh.	In.
	23	41		III.	Tr.	In.
3	0	47		III.	Sh.	Eg.
	2	17		III.	Tr.	Eg.
	6	29	7.5	I. *	Ec.	Dis.
	9	4		I. *	Oc.	Re.
	18	3	17.4	II. *	Ec.	Dis.
	21	27		II.	Oc.	Re.
4	3	48		I.	Sh.	In.
	4	8		I.	Tr.	In.
	6	3		I.	Sh.	Eg.
	6	24		I. *	Tr.	Eg.
5	0	57	40.0	I.	Ec.	Dis.
	3	30		I.	Oc.	Re.
	12	10		II. *	Sh.	In.
	12	48		II. *	Tr.	In.
	14	54		II. *	Sh.	Eg.
	15	31		II. *	Tr.	Eg.
	22	16		I.	Sh.	In.
	22	34		I.	Tr.	In.
6	0	31		I.	Sh.	Eg.
	0	50		I.	Tr.	Eg.
	12	3	48.9	III.*	Ec.	Dis.
	15	45		III.*	Oc.	Re.
	19	26	16.8	I.	Ec.	Dis.
	21	56		I.	Oc.	Re.
7	7	20	55.4	II. *	Ec.	Dis.
	10	34		II. *	Oc.	Re.
	16	45		I. *	Sh.	In.
	17	0		I. *	Tr.	In.
	19	0		I.	Sh.	Eg.
	19	16		I.	Tr.	Eg.
8	13	54	49.5	I. *	Ec.	Dis.
	16	22		I. *	Oc.	Re.
9	1	28		II.	Sh.	In.
	1	55		II.	Tr.	In.
	4	12		II.	Sh.	Eg.
	4	38		II.	Tr.	Eg.
	11	13		I. *	Sh.	In.
	11	26		I. *	Tr.	In.
	13	28		I. *	Sh.	Eg.
	13	42		I. *	Tr.	Eg.
10	2	9		III.	Sh.	In.
	2	58		III.	Tr.	In.
	4	47		III.	Sh.	Eg.
	5	33		III.	Tr.	Eg.
	8	23	29.2	I. *	Ec.	Dis.
	10	48		I. *	Oc.	Re.
	20	38	49.0	II.	Ec.	Dis.
	23	41		II.	Oc.	Re.
11	5	42		I.	Sh.	In.
	5	52		I. *	Tr.	In.
11	7	56		I. *	Sh.	Eg.
	8	8		I. *	Tr.	Eg.
12	2	52	4.0	I.	Ec.	Dis.
	5	14		I.	Oc.	Re.
	14	46		II. *	Sh.	In.
	15	2		II. *	Tr.	In.
	17	30		II. *	Sh.	Eg.
	17	45		II. *	Tr.	Eg.
13	0	10		I.	Sh.	In.
	0	18		I.	Tr.	In.
	2	25		I.	Sh.	Eg.
	2	33		I.	Tr.	Eg.
	16	3	11.5	III.*	Ec.	Dis.
	19	0		III.	Oc.	Re.
	21	20	43.3	I.	Ec.	Dis.
	23	40		I.	Oc.	Re.
14	9	56	27.7	II. *	Ec.	Dis.
	12	48		II. *	Oc.	Re.
	18	39		I. *	Sh.	In.
	18	44		I.	Tr.	In.
	20	54		I.	Sh.	Eg.
	20	59		I.	Tr.	Eg.
15	15	49	18.1	I. *	Ec.	Dis.
	18	6		I. *	Oc.	Re.
16	4	5		II.	Sh.	In.
	4	9		II.	Tr.	In.
	6	49		II. *	Sh.	Eg.
	6	52		II. *	Tr.	Eg.
	13	8		I. *	Sh.	In.
	13	10		I. *	Tr.	In.
	15	23		I. *	Sh.	Eg.
	15	25		I. *	Tr.	Eg.
17	6	8		III.*	Sh.	In.
	6	12		III.*	Tr.	In.
	8	48		III.*	Sh.	Eg.
	8	48		III.*	Tr.	Eg.
	10	16		I. *	Oc.	Dis.
	12	31		I. *	Oc.	Re.
	23	11		II.	Oc.	Dis.
18	1	54		II.	Oc.	Re.
	7	36		I. *	Tr.	In.
	7	36		I. *	Sh.	In.
	9	50		I. *	Tr.	Eg.
	9	51		I. *	Sh.	Eg.
19	4	42		I.	Oc.	Dis.
	6	57	51.8	I. *	Ec.	Re.
	17	16		II. *	Tr.	In.
	17	23		II. *	Sh.	In.
	19	59		II.	Tr.	Eg.
	20	7		II.	Sh.	Eg.
20	2	2		I.	Tr.	In.
	2	5		I.	Sh.	In.
	4	16		I.	Tr.	Eg.
	4	20		I.	Sh.	Eg.
	19	40		III.	Oc.	Dis.
	22	33	44.9	III.	Ec.	Re.
	23	8		I.	Oc.	Dis.
21	1	26	35.8	I.	Ec.	Re.
	12	17		II. *	Oc.	Dis.
	15	10	43.6	II. *	Ec.	Re.
	20	28		I.	Tr.	In.
21	20	33		I.	Sh.	In.
	22	42		I.	Tr.	Eg.
	22	48		I.	Sh.	Eg.
22	17	34		I. *	Oc.	Dis.
	19	55	15.0	I.	Ec.	Re.
23	6	23		II. *	Tr.	In.
	6	41		II. *	Sh.	In.
	9	7		II. *	Tr.	Eg.
	9	25		II. *	Sh.	Eg.
	14	54		I. *	Tr.	In.
	15	2		I. *	Sh.	In.
	17	8		I. *	Tr.	Eg.
	17	19		I. *	Sh.	Eg.
24	9	27		III.*	Tr.	In.
	10	7		III.*	Sh.	In.
	12	0		I. *	Oc.	Dis.
	12	3		III.*	Tr.	Eg.
	12	48		III.*	Sh.	Eg.
	14	24	1.5	I. *	Ec.	Re.
25	1	24		II.	Oc.	Dis.
	4	28	33.7	II.	Ec.	Re.
	9	19		I. *	Tr.	In.
	9	31		I. *	Sh.	In.
	11	34		I. *	Tr.	Eg.
	11	46		I. *	Sh.	Eg.
26	6	26		I. *	Oc.	Dis.
	8	52	43.1	I. *	Ec.	Re.
	19	31		II.	Tr.	In.
	20	0		II.	Sh.	In.
	22	15		II.	Tr.	Eg.
	22	43		II.	Sh.	Eg.
27	3	45		I.	Tr.	In.
	4	0		I.	Sh.	In.
	6	0		I. *	Tr.	Eg.
	6	14		I. *	Sh.	Eg.
	22	56		III.	Oc.	Dis.
28	0	52		I.	Oc.	Dis.
	2	34	53.4	III.	Ec.	Re.
	3	21	29.4	I.	Ec.	Re.
	14	31		II. *	Oc.	Dis.
	17	46	15.4	II. *	Ec.	Re.
	22	11		I.	Tr.	In.
	22	28		I.	Sh.	In.
29	0	26		I.	Tr.	Eg.
	0	43		I.	Sh.	Eg.
	19	18		I.	Oc.	Dis.
	21	50	10.7	I.	Ec.	Re.
30	8	39		II. *	Tr.	In.
	9	18		II. *	Sh.	In.
	11	23		II. *	Tr.	Eg.
	12	2		II. *	Sh.	Eg.
	16	37		I. *	Tr.	In.
	16	57		I. *	Sh.	In.
	18	52		I.	Tr.	Eg.
	19	12		I.	Sh.	Eg.
31	12	42		III.*	Tr.	In.
	13	44		I. *	Oc.	Dis.
	14	7		III.*	Sh.	In.
	15	19		III.*	Tr.	Eg.
	16	18	59.6	I. *	Ec.	Re.
	16	49		III.*	Sh.	Eg.

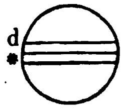
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

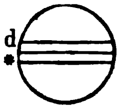
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

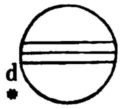
I.



II.

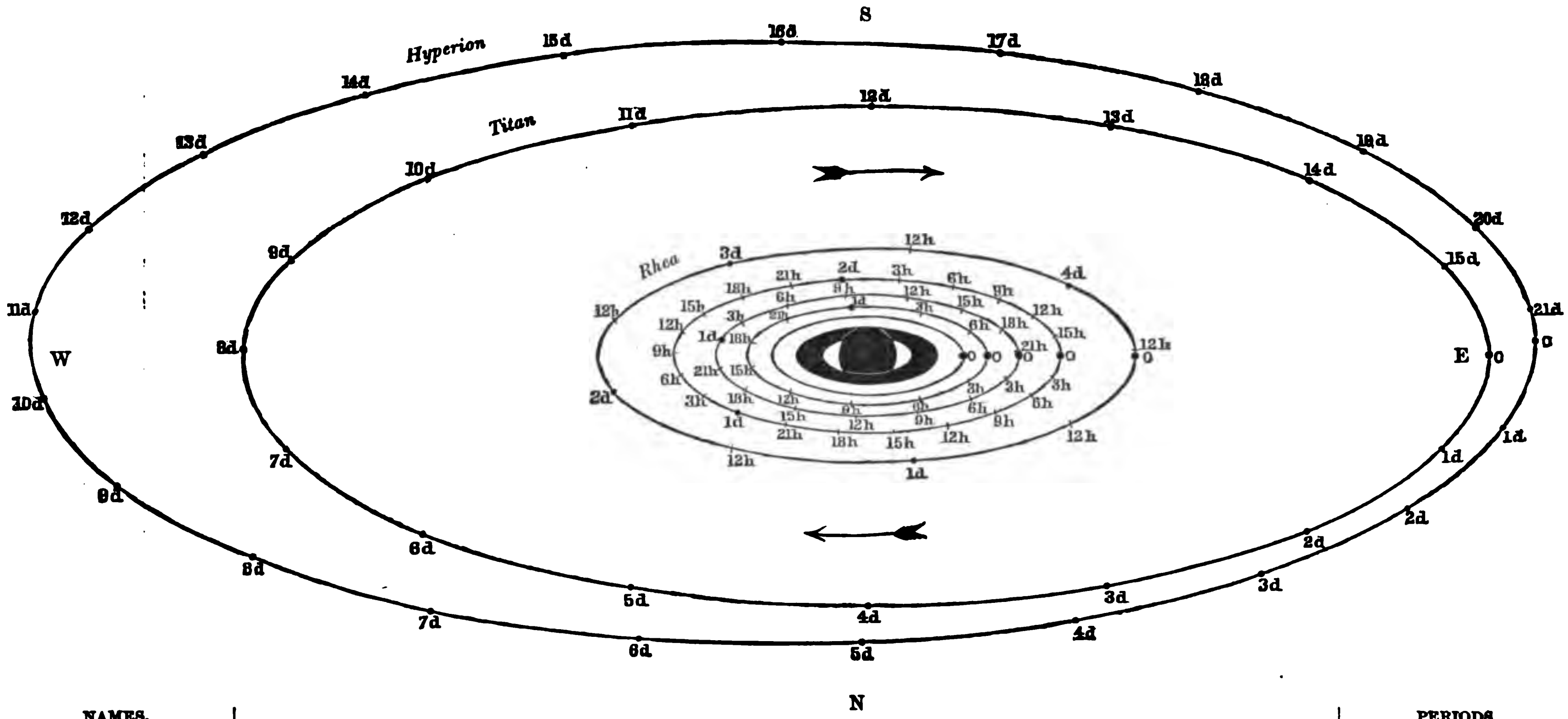


III.



Configurations at 12ʰ for an Inverting Telescope.

Day.	West.		East.
1	4· ·1	○	2· 3·
2	4· 2· . 1·	○	3·
3	4· 3· ·2	○	·1
4	·4 3· 1·	○	·2
5	·4 ·3	○2·	·1
6	·4 ·2 ·1 ·3	○	
7	·4	○	·2 1· ·3
8	·1	○	·4 2· 3·
9	○ 1· 2·	○	3· ·4
10	·23·	○	·1 ·4
11	3· 1·	○	·2 ·4
12	·3	○	2· ·1 4·
13	2· ·1 ·3	○	4·
14		○	1· ·3 4· ·2 ●
15	·1	○·	4· 2· ·3
16	2· 4·	○1·	3·
17	4· ·2 3·	○	·1 ●
18	4· 3· 1·	○	·2
19	4· ·3	○	$\overset{2\cdot}{\cdot 1}$
20	·4 2. 1· ·3	○	
21	·4	·○2	1· ·3
22	·4 ·1	○	2· ·3
23	·4 2·	○	1· 3·
24	○ 3· ·2 .4	○	·1 ●
25	3· 1·	○	·2 ·4
26	·3	○	·1 2· ·4
27	2· $_{\cdot 3}$1·	○	·4
28	·2	○	$\overset{1}{\cdot 3}$ ·4
29	·1	○	·2 ·3 4·
30		·○2	1· 3· 4·
31	·2 ·1	③·	4·



APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,
AT THE OPPOSITION OF 1882, NOVEMBER 14,
AS SEEN IN AN INVERTING TELESCOPE.

NAMES.

I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Japetus.

PERIODS.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.8
VIII.	79	22.0

WASHINGTON MEAN TIMES OF ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can be seen only within a few hours of each elongation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used: —

E., East Elongation,
I., Inferior Conjunction (north of planet),
W., West Elongation,
S., Superior Conjunction (south of planet).

MIMAS.

Elongations Visible at Washington.

1882. d	h		d	h		d	h		d	h		d	h		d	h	
Jan. 4	10.5	E.	Feb. 6	10.2	E.	Sept. 4	15.5	E.	Oct. 9	12.4	E.	Nov. 6	7.5	W.	Dec. 4	14.0	W.
5	9.1	E.	7	8.8	E.	5	14.1	E.	10	11.0	E.	9	14.7	E.	5	12.6	W.
6	7.7	E.	8	7.4	E.	6	12.7	E.	14	16.7	W.	10	13.3	E.	6	11.2	W.
7	6.4	E.	9	6.0	E.	11	17.1	W.	15	15.3	W.	11	11.9	E.	7	9.8	W.
8	5.0	E.	15	9.1	W.	12	15.7	W.	16	13.9	W.	12	10.5	E.	8	8.4	W.
12	10.8	W.	16	7.7	W.	13	14.3	W.	17	12 6	W.	13	9.1	E.	9	7.0	W.
13	9.4	W.	17	6.3	W.	14	13.0	W.	18	11.2	W.	14	7.7	E.	13	12.8	E.
14	8.0	W.	18	4.9	W.	15	11.6	W.	22	17.0	E.	17	14.9	W.	14	11 4	E.
15	6.6	W.	23	9.4	E.	20	16.0	E.	23	15.6	E.	18	13.5	W.	15	10.0	E.
16	5.2	W.	24	8.0	E.	21	14.6	E.	24	14.2	E.	19	12.1	W.	16	8.6	E.
20	11.1	E.	25	6.6	E.	22	13.2	E.	25	12.8	E.	20	10.7	W.	17	7.2	E.
21	9.7	E.				23	11.8	E.	26	11.4	E.	21	9.3	W.	18	5.9	E.
22	8.3	E.	Aug. 11	14.6	W.	28	16.3	W.	27	10.0	E.	22	7.9	W.	22	11.6	W.
23	6.9	E.	18	16.3	E.	29	14.9	W.	31	15.9	W.	26	13.7	E.	23	10.2	W.
24	5.5	E.	19	14 9	E.	30	13.5	W.	Nov. 1	14.5	W.	27	12.3	E.	24	8.8	W.
29	9.9	W.	26	16.6	W.	Oct. 1	12.1	W.	2	13.1	W.	28	10.9	E.	25	7.4	W.
30	8.5	W.	27	15.2	W.	6	16.6	E.	3	11.7	W.	29	9.6	E.	26	6.0	W.
31	7.2	W.	28	13.8	W.	7	15.2	E.	4	10.3	W.	30	8.2	E.	31	10.5	E.
Feb. 1	5.8	W.	Sept. 3	16.9	E.	8	13.8	E.	5	8.9	W.	Dec. 1	6.8	E.	32	9.1	E.

ENCELADUS.

1882. d	h		d	h		d	h		d	h		d	h		d	h	
Jan. 0	14.4	E.	Jan. 14	7.2	E.	Jan. 28	0.1	E.	Feb. 10	17.0	E.	Feb. 24	10.0	E.	Aug. 24	8 5	E.
1	23.4	E.	15	16.1	E.	29	9.0	E.	12	1.9	E.	25	18.9	E.	25	17.3	E.
3	8.2	E.	17	1.0	E.	30	17.9	E.	13	10.8	E.	27	3.8	E.	27	2.2	E.
4	17.1	E.	18	9.8	E.	Feb. 1	2.7	E.	14	19.7	E.	28	12.6	E.	28	11.1	E.
6	2.0	E.	19	18.7	E.	2	11.6	E.	16	4.6	E.	Aug. 16	3.1	E.	29	20.0	E.
7	10.8	E.	21	3.6	E.	3	20.5	E.	17	13.5	E.	17	12.0	E.	31	4.9	E.
8	19.7	E.	22	12.5	E.	5	5.4	E.	18	22.4	E.	18	20.9	E.	Sept. 1	13.7	E.
10	4.6	E.	23	21.4	E.	6	14.3	E.	20	7.3	E.	20	5.8	E.	2	22.6	E.
11	13.5	E.	25	6.3	E.	7	23.2	E.	21	16.2	E.	21	14.7	E.	4	7.5	E.
12	22.4	E.	26	15.2	E.	9	8.1	E.	23	1.1	E.	22	23.6	E.	5	16.4	E.

WASHINGTON MEAN TIMES OF EAST ELONGATIONS.

ENCELADUS (*Con.*)

1882.	d	h			d	h			d	h			d	h			d	h			d	h	
Sept.	7	1.3	E.	Sept.	27	14.6	E.	Oct.	18	3.8	E.	Nov.	7	16.9	E.	Nov.	28	6.1	E.	Dec.	18	19.3	E.
	8	10.1	E.		28	23.4	E.		19	12.6	E.		9	1.7	E.		29	14.9	E.		20	4.1	E.
	9	19.0	E.		30	8.3	E.		20	21.5	E.		10	10.6	E.		30	23.8	E.		21	13.0	E.
	11	3.9	E.	Oct.	1	17.2	E.		22	6.4	E.		11	19.5	E.	Dec.	2	8.7	E.		22	21.9	E.
	12	12.8	E.		3	2.1	E.		23	15.3	E.		13	4.4	E.		3	17.6	E.		24	6.8	E.
	13	21.7	E.		4	11.0	E.		25	0.2	E.		14	13.3	E.		5	2.5	E.		25	15.6	E.
	15	6.6	E.		5	19.8	E.		26	9.0	E.		15	22.1	E.		6	11.3	E.		27	0.4	E.
	16	15.5	E.		7	4.7	E.		27	17.9	E.		17	7.0	E.		7	20.2	E.		28	9.3	E.
	18	0.4	E.		8	13.6	E.		29	2.8	E.		18	15.9	E.		9	5.1	E.		29	18.2	E.
	19	9.3	E.		9	22.5	E.		30	11.7	E.		20	0.8	E.		10	14.0	E.		31	3.1	E.
	20	18.2	E.		11	7.4	E.		31	20.5	E.		21	9.7	E.		11	22.9	E.	1883.			
	22	3.0	E.		12	16.2	E.	Nov.	2	5.4	E.		22	18.5	E.		13	7.7	E.	Jan.	1	11.9	E.
	23	11.9	E.		14	1.1	E.		3	14.2	E.		24	3.4	E.		14	16.6	E.		2	20.8	E.
	24	20.8	E.		15	10.0	E.		4	23.1	E.		25	12.3	E.		16	1.5	E.		4	5.6	E.
	26	5.7	E.		16	18.9	E.		6	8.0	E.		26	21.2	E.		17	10.4	E.		5	14.5	E.

TETHYS.

1882.	d	h			d	h			d	h			d	h			d	h			d	h	
Jan.	1	3.3	E.	Feb.	7	21.5	E.	Aug.	15	18.1	E.	Sept.	20	15.0	E.	Oct.	26	11.6	E.	Dec.	1	8.1	E.
	3	0.6	E.		9	18.8	E.		17	15.4	E.		22	12.3	E.		28	8.9	E.		3	5.4	E.
	4	21.9	E.		11	16.1	E.		19	12.7	E.		24	9.6	E.		30	6.2	E.		5	2.7	E.
	6	19.3	E.		13	13.5	E.		21	10.1	E.		26	6.9	E.	Nov.	1	3.5	E.		7	0.0	E.
	8	16.6	E.		15	10.8	E.		23	7.4	E.		28	4.2	E.		3	0.8	E.		8	21.3	E.
	10	13.9	E.		17	8.2	E.		25	4.7	E.		30	1.5	E.		4	22.0	E.		10	18.6	E.
	12	11.2	E.		19	5.5	E.		27	2.0	E.	Oct.	1	22.8	E.		6	19.3	E.		12	15.8	E.
	14	8.4	E.		21	2.8	E.		28	23.3	E.		3	20.1	E.		8	16.6	E.		14	13.1	E.
	16	5.7	E.		23	0.1	E.		30	20.6	E.		5	17.4	E.		10	13.9	E.		16	10.4	E.
	18	3.0	E.		24	21.4	E.	Sept.	1	17.9	E.		7	14.7	E.		12	11.2	E.		18	7.7	E.
	20	0.3	E.		26	18.7	E.		3	15.2	E.		9	12.0	E.		14	8.5	E.		20	5.0	E.
	21	21.7	E.		28	16.1	E.		5	12.6	E.		11	9.3	E.		16	5.8	E.		22	2.3	E.
	23	19.0	E.	Mar.	2	13.4	E.		7	9.9	E.		13	6.5	E.		18	3.1	E.		23	23.6	E.
	25	16.3	E.		4	10.7	E.		9	7.2	E.		15	3.8	E.		20	0.4	E.		25	20.9	E.
	27	13.6	E.						11	4.5	E.		17	1.1	E.		21	21.6	E.		27	18.2	E.
	29	10.9	E.	Aug.	8	4.8	E.		13	1.8	E.		18	22.4	E.		23	18.9	E.		29	15.5	E.
	31	8.2	E.		10	2.1	E.		14	23.1	E.		20	19.7	E.		25	16.2	E.		31	12.8	E.
Feb.	2	5.5	E.		11	23.4	E.		16	20.4	E.		22	17.0	E.		27	13.5	E.	1883.			
	4	2.8	E.		13	20.8	E.		18	17.7	E.		24	14.3	E.		29	10.8	E.	Jan.	2	10.1	E.
	6	0.2	E.																				

DIONE.

1882.	d	h			d	h			d	h			d	h			d	h			d	h	
Jan.	1	22.1	E.	Feb.	3	18.4	E.	Aug.	22	17.0	E.	Sept.	24	13.4	E.	Oct.	27	9.3	E.	Nov.	29	5.1	E.
	4	15.8	E.		6	12.1	E.		25	10.8	E.		27	7.0	E.		30	2.9	E.	Dec.	1	22.7	E.
	7	9.4	E.		9	5.8	E.		28	4.5	E.		30	0.7	E.	Nov.	1	20.6	E.		4	16.3	E.
	10	3.1	E.		11	23.5	E.		30	22.2	E.	Oct.	2	18.3	E.		4	14.2	E.		7	10.0	E.
	12	20.8	E.		14	17.2	E.	Sept.	2	15.9	E.		5	12.0	E.		7	7.9	E.		10	3.7	E.
	15	14.5	E.		17	10.9	E.		5	9.6	E.		8	5.7	E.		10	1.5	E.		12	21.3	E.
	18	8.2	E.		20	4.6	E.		8	3.3	E.		10	23.4	E.		12	19.2	E.		15	15.0	E.
	21	1.9	E.		22	22.3	E.		10	20.9	E.		13	17.0	E.		15	12.8	E.		18	8.6	E.
	23	19.6	E.						13	14.6	E.		16	10.7	E.		18	6.5	E.		21	2.3	E.
	26	13.3	E.	Aug.	14	11.9	E.		16	8.3	E.		19	4.3	E.		21	0.1	E.		23	19.9	E.
	29	7.0	E.		17	5.6	E.		19	2.0	E		21	22.0	E.		23	17.8	E.		26	13.6	E.
Feb.	1	0.7	E.		19	23.3	E		21	19.7	E.		24	15.6	E.		26	11.4	E.		29	7.3	E.

RHEA.				TITAN.				HYPERION.			
d	h	d	h	d	h	d	h	d	h	d	h
Jan. 1	1.9 E.	Sept.15	20.1 E.	Jan. 1	20.3 I.	Sept 30	18.2 I.	Jan. 2	10.7 I.	Sept.21	7.9 W.
5	14.4 E.	20	8.5 E.	5	20.0 W.	Oct. 4	17.7 W.	7	18.5 W.	26	15.2 S.
10	2.8 E.	24	20.9 E.	9	19.7 S.	8	17.2 S.	13	2.3 S.	Oct. 1	22.5 E.
14	15.2 E.	29	9.2 E.	13	19.4 E.	12	16.6 E.	18	10.1 E.	7	5.8 I.
19	3.6 E.	Oct. 3	21.6 E.	17	19.1 I.	16	16.1 I.	23	18.1 I.	12	13.1 W.
23	16.1 E.	8	10.0 E.	21	18.9 W.	20	15.5 W.	29	2.1 W.	17	20.4 S.
28	4.5 E.	12	22.3 E.	25	18.6 S.	24	14.9 S.	Feb. 3	10.2 S.	23	3.7 E.
Feb. 1	17.0 E.	17	10.7 E.	29	18.3 E.	28	14.3 E.	8	18.3 E.	28	10.8 I.
6	5.6 E.	21	23.0 E.	Feb. 2	18.3 I.	Nov. 1	13.7 I.	14	2.5 I.	Nov. 2	17.9 W.
10	18.0 E.	26	11.3 E.	6	18.4 W.	5	13.0 W.	19	10.8 W.	8	1.0 S.
15	6.5 E.	30	23.6 E.	10	18.4 S.	9	12.3 S.	24	19.1 S.	13	8.1 E.
19	19.1 E.	Nov. 4	12.0 E.	14	18.5 E.	13	11.6 E.	Mar. 2	3.4 E.	18	15.2 I.
24	7.5 E.	9	0.3 E.	18	18.4 I.	17	10.9 I.			23	22.2 W.
		13	12.6 E.	22	18.4 W.	21	10.2 W.			29	5.3 S.
		18	0.9 E.	26	18.3 S.	25	9.5 S.	July 30	1.4 E.	Dec. 4	12 4 E.
		22	13.3 E.			29	8.9 E.	Aug. 4	9.6 I.	9	19.7 I.
		27	1.5 E.	Aug.29	21.1 I.	Dec. 3	8.3 I.	9	17.7 W.	15	3.1 W.
Aug.15	5.0 E.	Dec. 1	13.8 E.	Sept. 2	20.8 W.	7	7.7 W.	15	1.8 S.	20	10.4 S.
19	17.4 E.	6	2.2 E.	6	20.5 S.	11	7.1 S.	20	9.9 E.	25	17.7 E.
24	5.9 E.	10	14.5 E.	10	20.3 E.	15	6.6 E.	25	17.8 I.	31	1.0 I.
28	18.4 E.	15	2.9 E.	14	19.9 I.	19	6.0 I.	31	1.6 W.	1883.	
Sept. 2	6.8 E.	19	15.2 E.	18	19.5 W.	23	5.5 W.	Sept. 5	9.5 S.	Jan. 5	8.3 W.
6	19.3 E.	24	3.6 E.	22	19.1 S.	27	5.0 S.	10	17.3 E.	10	15.6 S.
11	7.7 E.	28	15.9 E.	26	18.7 E.	31	4.5 E.	16	0.6 I.	15	22.8 E.

JAPETUS	East Elongation . . .	January 11	June 21	September 10	November 28
	Inferior Conjunction .	January 31	July 11	September 30	December 18
	West Elongation . .	February 20	August 2	October 20	
	Superior Conjunction .	March 13	August 22	November 9	

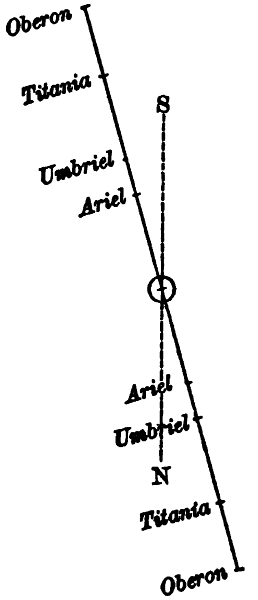
THE APPARENT ELEMENTS OF SATURN'S RINGS.

Greenwich Mean Noon.	*a* Outer Major Axis.	*b* Outer Minor Axis.	*p* Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	*l* The Elevation of the Earth above the Plane of the Ring.	*l′* The Elevation of the Sun above the Plane of the Ring.	*u* Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on Equator.	*u′* Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on Ecliptic.
Jan. 0	42″.93	13″.32	+ 0° 17′.5	− 18° 4′.8	− 19° 57′.5	87° 39′.8	44° 55′.6
20	41.42	12.95	0 16.8	18 13.1	20 10.9	87 45.7	45 1.6
Feb. 9	39.97	12.74	+ 0 10.7	18 35.5	20 24.2	88 34.9	45 50.9
Mar. 1	38.72	12.70	− 0 0.3	19 9.3	20 37.3	90 2.3	47 18.3
21	37.76	12.81	0 15.2	19 50.5	20 50.3	92 0.8	49 16.9
Apr. 10	37.13	13.06	− 0 32.9	− 20 35.2	− 21 3.1	94 21.7	51 37.9
30	36.85	13.40	0 52.5	21 19.8	21 15.7	96 56.1	54 12.4
May 20	36.92	13.84	1 12.6	22 1.4	21 28.1	99 35.4	56 51.8
June 9	37.34	14.36	1 32.2	22 37.6	21 40.4	102 9.8	59 26.2
29	38.09	14.95	1 50.0	23 6.8	21 52.5	104 31.4	61 47.9
July 19	39.15	15.59	− 2 4.8	− 23 28.2	− 22 4.3	106 29.7	63 46.3
Aug. 8	40.47	16.26	2 15.6	23 41.2	22 15.9	107 56.4	65 13.1
28	41.96	16.91	2 21.7	23 45.8	22 27.4	108 43.2	66 0.0
Sept. 17	43.48	17.48	2 21.6	23 42.1	22 38.7	108 45.1	66 1.9
Oct. 7	44.82	17.88	2 16.2	23 31.0	22 49.7	108 2.1	65 19.0
27	45.74	18.04	− 2 6.6	− 23 13.9	− 23 0.5	106 42.0	63 59.0
Nov. 16	46.04	17.91	1 53.6	22 53.8	23 11.1	105 1.2	62 18.3
Dec. 6	45.64	17.53	1 41.1	22 35.1	23 21.5	103 22.0	60 39.2
26	44.64	16.99	1 31.6	22 22.5	23 31.7	102 6.3	59 23.6
31	44.31	16.85	− 1 30.0	− 22 20.8	− 23 34.3	101 53.2	59 10.5

The factor to be multiplied by *a* and *b* to obtain the axes of

The inner ellipse of the outer ring	= 0.8801	log factor = 9.9445
The outer ellipse of the inner ring	= 0.8599	log factor = 9.9344
The inner ellipse of the inner ring	= 0.6650	log factor = 9.8228
The inner ellipse of the dusky ring	= 0.5486	log factor = 9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the ring is the southern one.



APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1882,
AS SEEN IN AN INVERTING TELESCOPE.

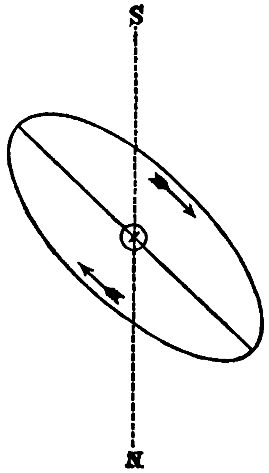
(The planes of the orbits are directed toward the earth about 1882, March 25.)

WASHINGTON MEAN TIMES OF ELONGATIONS.

ARIEL.						UMBRIEL.						TITANIA.						OBERON.			
North.			South.			North.			South.			North.			South.			N. and S.			
	d	h		d	h		d	h		d	h		d	h		d	h		d	h	
Jan.	2	4.3	Jan.	0	22.1	Jan.	1	19.4	Jan.	3	21.2	Jan.	0	8.5	Jan.	4	17.0	Jan.	0	4.7	S.
	9	17.8		8	11.5		10	2.4		12	4.2		9	1.4		13	9.9		6	22.3	N.
	17	7.2		16	1.0		18	9.3		20	11.1		17	18.3		22	2.9		13	15.9	S.
	24	20.7		23	14.5		26	16.2		28	18.0		26	11.3		30	19.8		20	9.4	N.
Feb.	1	10.2		31	4.0	Feb.	3	23.1	Feb.	6	0.9	Feb.	4	4.3	Feb.	8	12.8		27	2.9	S.
	8	23.6	Feb.	7	17.4		12	6.0		14	7.8		12	21.2		17	5.7	Feb.	2	20.5	N.
	16	13.1		15	6.9		20	12.9		22	14.7		21	14.2		25	22.7		9	14.1	S
	24	2.6		22	20.3		28	19.8	Mar.	2	21.6	Mar.	2	7.1	Mar.	6	15.6		16	7.6	N.
Mar.	3	16.0	Mar.	2	9.8	Mar.	9	2.8		11	4.6		11	0.0		15	8.5		23	1.2	S.
	11	5.5		9	23.3		17	9.7		19	11.5		19	17.0		24	1.5	Mar.	1	18.7	N.
	18	19.0		17	12.8		25	16.6		27	18.5		28	9.9	Apr.	1	18.4		8	12.3	S.
	26	8.4		25	2.2	Apr.	2	23.5	Apr.	5	1.4	Apr.	6	2.8		10	11.4		15	5.9	N.
Apr.	2	21.9	Apr.	1	15.7		11	6.4		13	8.3		14	19.8		19	4.3		21	23.4	S.
	10	11.4		9	5.2		19	13.4		21	15.2		23	12.7		27	21.2		28	17.0	N.
	18	0.8		16	18.6		27	20.3		29	22.1	May	2	5.7	May	6	14.2	Apr.	4	10.5	S.
	25	14 3		24	8.1	May	6	3.2	May	8	5.0		10	22.6		15	7.1		11	4.1	N.
May	3	3.8	May	1	21.6		14	10.1		16	11.9		19	15.6		24	0.1		17	21.7	S.
	10	17.2		9	11.0		22	17.0		24	18.8		28	8.5	June	1	17.0		24	15.2	N.
	18	6.7		17	0.5		31	0.0	June	2	1.8	June	6	1.4		10	9.9	May	1	8.7	S.
	25	20.2		24	14.0	June	8	6.9		10	8.7		14	18 4		19	2.9		8	2.3	N.
June	2	9.6	June	1	3.4		16	13.8		18	15.6		23	11.3		27	19.8		14	19.9	S.
Dec.	8	10.4	Dec.	7	4.2	Nov.	29	8.4	Dec.	1	10.2	Nov.	28	4.4	Dec.	1	3.0	Dec.	9	12.4	N.
	15	23.9		14	17.7	Dec.	7	15.3		9	17.1	Dec.	5	21.3		9	19.9		16	5.9	S.
	23	13.4		22	7.2		15	22.2		18	0.0		14	14.3		18	12.8		22	23.5	N.
	31	2.8		29	20.6		24	5.1		26	6.9		23	7.2		27	5.7		29	17.1	S.

	d	h		d	h
Period of Ariel,	2	12.489	Period of Titania,	8	16.942
Period of Umbriel,	4	3.460	Period of Oberon,	13	11.119

Note.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1882, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIMES OF ELONGATIONS.

South West.			North East.			South West			North East.			South West.			North East.		
	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	3.5	Jan.	4	2.0	Aug.	6	14.2	Aug.	9	12.7	Oct.	10	5.7	Oct.	13	4.2
	7	0.5		9	23.1		12	11.3		15	9.8		16	2.7		19	1.2
	12	21.6		15	20.1		18	8.3		21	6.8		21	23.8		24	22.3
	18	18.6		21	17.2		24	5.3		27	3.8		27	20.8		30	19.3
	24	15.7		27	14.2		30	2.4	Sept.	2	0.9	Nov.	2	17.9	Nov.	5	16.4
	30	12.7	Feb.	2	11.3	Sept.	4	23.4		7	21.9		8	14.9		11	13.4
Feb.	5	9.8		8	8.3		10	20.5		13	19.0		14	12.0		17	10.5
	11	6.8		14	5.3		16	17.5		19	16.0		20	9.0		23	7.5
	17	3 9		20	2.4		22	14.5		25	13.1		26	6.1		29	4.6
	23	0.9		25	23.4		28	11.6	Oct.	1	10.1	Dec.	2	3.1	Dec.	5	1.6
	28	22.0	Mar.	3	20.5	Oct.	4	8.6		7	7.2		8	0.1		10	22.6

The above times are those of each passage of the satellite through an apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, $5^d\ 21^h.045$.

In the above diagrams, the central circle represents the planet, and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		° ′
Jan.	1	6	–	☉ Perigee.	
	2	20	–	♀ in ☋	
	2	20	5	☌ ♂ ☾ .... ♂ +	5 49
	6	1	–	☌ ☿ ☉ Superior.	
	6	4	–	♄ Stationary.	
	9	8	15	☌ ♅ ☾ .... ♅ +	6 20
	9	16	–	♃ Stationary.	
	15	10	–	☿ greatest Hel. Lat. S.	
	18	11	4	☌ ♀ ☾ .... ♀ —	4 13
	19	17	49	☌ ☿ ☾ .... ☿ —	6 47
	23	2	–	♆ Stationary.	
	25	5	–	□ ♄ ☉	
	25	16	56	☌ ♄ ☾ .... ♄ —	5 10
	26	6	15	☌ ♆ ☾ .... ♆ —	3 54
	26	10	55	☌ ♃ ☾ .... ♃ —	2 45
	29	14	12	☌ ♂ ☾ .... ♂ +	5 15
Feb.	2	0	–	♂ Stationary.	
	2	0	–	□ ♆ ☉	
	3	11	–	☿ in ☊	
	5	13	–	□ ♃ ☉	
	5	13	5	☌ ♅ ☾ .... ♅ +	6 10
	6	6	–	♀ Aphelion.	
	6	10	–	☿ greatest elong. E.	18 13
	8	2	–	☿ Perihelion.	
	12	19	–	☿ Stationary.	
	17	12	32	☌ ♀ ☾ .... ♀ —	6 47
	17	23	10	☌ ☿ ☾ .... ☿ —	1 38
	18	10	–	☿ greatest Hel. Lat. N.	
	20	7	–	☌ ♀ ☉ Superior.	
	20	17	–	☌ ☿ ♀ .... ☿ +	5 29
	21	16	–	☌ ☿ ☉ Inferior.	
	22	3	2	☌ ♄ ☾ .... ♄ —	4 38
	22	13	47	☌ ♆ ☾ .... ♆ —	3 34
	22	22	27	☌ ♃ ☾ .... ♃ —	2 7
	26	2	25	☌ ♂ ☾ .... ♂ +	5 11
	28	16	–	♀ greatest Hel. Lat. S.	
Mar.	4	16	47	☌ ♅ ☾ .... ♅ +	6 6
	6	11	–	☍ ♅ ☉	
	6	19	–	☿ Stationary.	
	13	21	–	☿ in ☋	
	17	0	21	☌ ☿ ☾ .... ☿ —	6 2
	19	11	33	☌ ♀ ☾ .... ♀ —	5 47
	20	0	–	☉ enters ♈, Spring com.	
	20	18	–	☿ greatest elong. W.	27 46
	21	16	57	☌ ♄ ☾ .... ♄ —	4 5
	22	0	10	☌ ♆ ☾ .... ♆ —	3 16
	22	15	7	☌ ♃ ☾ .... ♃ —	1 23
	24	1	–	☿ Aphelion.	
	25	–	–	♅ Perihelion.	
	26	5	50	☌ ♂ ☾ .... ♂ +	5 39
	30	17	–	♂ greatest Hel. Lat. N.	
	31	20	52	☌ ♅ ☾ .... ♅ +	6 11
Apr.	1	12	–	□ ♂ ☉	
Apr.	13	10	–	☿ greatest Hel. Lat. S.	
	16	5	13	☌ ☿ ☾ .... ☿ —	6 28
	18	7	13	☌ ♀ ☾ .... ♀ —	1 52
	18	8	39	☌ ♄ ☾ .... ♄ —	3 38
	18	11	58	☌ ♆ ☾ .... ♆ —	3 5
	19	2	–	☌ ♀ ♄ .... ♀ +	1 53
	19	10	51	☌ ♃ ☾ .... ♃ —	0 40
	20	18	–	☌ ♀ ♆ .... ♀ +	1 34
	23	15	44	☌ ♂ ☾ .... ♂ +	6 17
	25	23	–	♀ in ☊	
	28	2	43	☌ ♅ ☾ .... ♅ +	6 17
May	1	14	–	☌ ☿ ☉ Superior.	
	2	11	–	☿ in ☊	
	3	14	–	☌ ☿ ♄ .... ☿ +	2 22
	3	22	–	☌ ☿ ♆ .... ☿ +	2 3
	4	11	–	♂ Aphelion.	
	4	14	–	☌ ♀ ♃ .... ♀ +	0 59
	5	15	–	☌ ♄ ☉	
	6	6	–	☌ ♆ ☉	
	7	1	–	☿ Perihelion.	
	10	20	–	☌ ♄ ♆ .... ♄ —	0 22
	12	16	–	☌ ☿ ♃ .... ☿ +	2 16
	15	23	9	☌ ♆ ☾ .... ♆ —	2 57
	15	23	55	☌ ♄ ☾ .... ♄ —	3 16
	16	–	–	☉ eclipsed, invis. at Wash.	
	17	7	24	☌ ♃ ☾ .... ♃ —	0 0
	17	9	–	☿ greatest Hel. Lat. N.	
	17	23	20	☌ ☿ ☾ .... ☿ +	3 33
	18	–	–	♂ in Præsepe.	
	18	8	14	☌ ♀ ☾ .... ♀ +	2 45
	21	14	–	♅ Stationary.	
	22	7	8	☌ ♂ ☾ .... ♂ +	6 46
	25	10	11	☌ ♅ ☾ .... ♅ +	6 19
	29	14	–	♀ Perihelion.	
	29	15	–	☌ ♃ ☉	
	29	19	–	☌ ☿ ♀ .... ☿ W.N.W.	1 43
	31	21	–	☿ greatest elong. E.	23 30
June	4	15	–	□ ♅ ☉	
	9	20	–	☿ in ☋	
	12	8	21	☌ ♆ ☾ .... ♆ —	2 52
	12	13	15	☌ ♄ ☾ .... ♄ —	2 57
	14	3	8	☌ ♃ ☾ .... ♃ +	0 37
	14	12	–	☿ Stationary.	
	16	9	2	☌ ☿ ☾ .... ☿ +	1 46
	17	16	34	☌ ♀ ☾ .... ♀ +	6 18
	20	0	–	☿ Aphelion.	
	20	0	52	☌ ♂ ☾ .... ♂ +	6 50
	20	11	–	♀ greatest Hel. Lat. N.	
	20	20	–	☉ enters ♋, Summer com.	
	21	18	55	☌ ♅ ☾ .... ♅ +	6 12
	26	14	–	☌ ♂ α Leonis . . ♂ +	0 45
	27	13	–	☌ ☿ ☉ Inferior.	
July	3	6	–	☉ Apogee.	

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m			°	′
July	8	12	-	☿	Stationary.		
	9	15	27	☌ ♆ ☾	.... ♆ —	2	43
	10	0	-	☌ ♄ ☾	.... ♄ —	2	38
	10	9	-	☿	greatest Hel. Lat. S.		
	11	21	8	☌ ♃ ☾	.... ♃ +	1	14
	13	0	11	☌ ☿ ☾	.... ☿ —	0	53
	14	3	-	☌ ♀	α Leonis . . ♀ +	1	4
	18	2	12	☌ ♀ ☾	.... ♀ +	6	57
	18	19	6	☌ ♂ ☾	.... ♂ +	6	16
	19	4	14	☌ ♅ ☾	.... ♅ +	5	59
	19	6	-	☿	greatest elong. W.	20	13
	26	19	-	☌ ♂ ♅	.... ♂ +	0	6
	29	10	-	☿	in ☊		
	29	16	-	☌ ♀ ♅	.... ♀ +	0	17
Aug.	1	18	-	☌ ♀ ♂	.... ♀ +	0	5
	3	0	-	☿	Perihelion.		
	5	21	33	☌ ♆ ☾	.... ♆ —	2	29
	6	9	0	☌ ♄ ☾	.... ♄ —	2	19
	8	13	7	☌ ♃ ☾	.... ♃ +	1	51
	10	19	-	□ ♆ ☉			
	13	6	37	☌ ☿ ☾	.... ☿ +	7	6
	13	8	-	☿	greatest Hel. Lat. N.		
	14	7	-	☌ ☿ ☉	Superior.		
	15	13	-	♀	in ☋		
	15	13	39	☌ ♅ ☾	.... ♅ +	5	45
	16	13	17	☌ ♂ ☾	.... ♂ +	5	4
	17	5	7	☌ ♀ ☾	.... ♀ +	3	48
	18	6	-	□ ♄ ☉			
	21	16	-	♆	Stationary.		
	28	3	-	☌ ☿ ♅	.... ☿ +	0	18
Sept.	2	4	17	☌ ♆ ☾	.... ♆ —	2	15
	2	16	56	☌ ♄ ☾	.... ♄ —	2	4
	5	3	2	☌ ♃ ☾	.... ♃ +	2	26
	5	19	-	☿	in ☋		
	6	7	-	♄	Stationary.		
	11	3	-	☌ ♅ ☉			
	11	23	3	☌ ♅ ☾	.... ♅ +	5	37
	13	23	20	☌ ☿ ☾	.... ☿ +	2	10
	14	7	32	☌ ♂ ☾	.... ♂ +	3	20
	16	0	-	☿	Aphelion.		
	16	0	19	☌ ♀ ☾	.... ♀ —	1	28
	18	23	-	♀	Aphelion.		
	19	23	-	☌ ☿	α Virginis . ☿ +	0	12
	20	13	-	☌ ☿ ♂	.... ☿ —	2	21
	22	11	-	☉	enters ♎, Autumn com.		
	22	18	-	□ ♃ ☉			
	26	14	-	♀	greatest elong. E.	46	36
	28	6	-	☿	greatest elong. E.	25	54
	29	12	42	☌ ♆ ☾	.... ♆ —	2	6
	30	0	49	☌ ♄ ☾	.... ♄ —	1	59
Oct.	2	14	50	☌ ♃ ☾	.... ♃ +	2	51
	6	9	-	☿	greatest Hel. Lat. S.		
	9	8	35	☌ ♅ ☾	.... ♅ +	5	35
Oct.	10	14	-	☿	Stationary.		
	11	9	-	♀	greatest Hel. Lat. S.		
	12	20	-	☌ ☿ ♂	.... ☿ —	3	25
	13	2	2	☌ ☿ ☾	.... ☿ —	2	7
	13	2	33	☌ ♂ ☾	.... ♂ +	1	15
	14	6	-	♂	in ☋		
	15	10	43	☌ ♀ ☾	.... ♀ —	6	11
	16	5	-	☌ ♀	α Scorpii . . ♀ —	0	8
	19	0	-	♃	Stationary.		
	22	11	-	☌ ☿ ☉	Inferior.		
	25	9	-	☿	in ☊		
	26	22	21	☌ ♆ ☾	.... ♆ —	2	7
	27	8	43	☌ ♄ ☾	.... ♄ —	2	6
	29	23	-	☿	Perihelion.		
	30	0	8	☌ ♃ ☾	.... ♃ +	3	0
	31	13	-	☿	Stationary.		
Nov.	1	-	-	♀	at greatest brilliancy.		
	5	18	19	☌ ♅ ☾	.... ♅ +	5	36
	7	9	-	☿	greatest elong. W.	19	3
	8	17	21	☌ ☿ ☾	.... ☿ +	4	27
	9	4	-	☍ ♆ ☉			
	9	7	-	☿	greatest Hel. Lat. N.		
	10	-	-	☉	eclipsed, invis. at Wash.		
	10	23	13	☌ ♂ ☾	.... ♂ —	0	56
	12	20	59	☌ ♀ ☾	.... ♀ —	7	17
	14	10	-	☍ ♄ ☉			
	14	18	-	♀	Stationary.		
	23	7	35	☌ ♆ ☾	.... ♆ —	2	11
	23	15	44	☌ ♄ ☾	.... ♄ —	2	18
	26	6	22	☌ ♃ ☾	.... ♃ +	2	53
Dec.	2	18	-	☿	in ☋		
	3	3	53	☌ ♅ ☾	.... ♅ +	5	32
	5	2	-	☌ ♀ ♂	.... ♀ +	0	6
	6	0	-	☌ ♀ ☉	Inferior and Transit.		
	6	16	-	♀	in ☊		
	8	19	-	☌ ☿ ♀	.... ☿ —	1	12
	9	10	58	☌ ♀ ☾	.... ♀ —	1	14
	9	14	10	☌ ☿ ☾	.... ☿ —	2	52
	9	22	11	☌ ♂ ☾	.... ♂ —	3	1
	10	8	-	☌ ♂ ☉			
	12	23	-	☿	Aphelion.		
	14	12	-	☌ ☿ ♂	.... ☿ —	0	39
	14	13	-	□ ♅ ☉			
	16	12	-	☌ ☿ ☉	Superior.		
	17	14	-	☍ ♃ ☉			
	20	14	52	☌ ♆ ☾	.... ♆ —	2	11
	20	21	7	☌ ♄ ☾	.... ♄ —	2	21
	21	5	-	☉	enters ♑, Winter com.		
	23	9	33	☌ ♃ ☾	.... ♃ +	2	39
	27	1	-	♀	Stationary.		
	28	4	-	♅	Stationary.		
	30	12	35	☌ ♅ ☾	.... ♅ +	5	22
	30	16	-	☉	Perigee.		

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude From Washington.	Longitude From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Åbo	+ 60 26 56.8	− 9 53.5	9.998902	− 6 37 20.3	− 1 29 8.2
Adelaide	− 34 57	+ 10 47.8	9.999526	−14 22 33.1	− 9 14 21.0
Albany	+ 42 39 49.5	− 11 28.2	9.999336	− 0 13 12.87	+ 4 54 59.22
Alfred	+ 42 15 19.8	− 11 27.2	9.999346	+ 0 2 55.00	+ 5 11 7.09
Algier	+ 36 45 2.7	− 11 1.6	9.999483	− 5 20 23.48	− 0 12 11.39
Allegheny	+ 40 27 41.6	− 11 21.6	9.999391	+ 0 11 50.84	+ 5 20 2.93
Altona	+ 53 32 45.3	− 11 0.8	9.999063	− 5 47 58.44	− 0 39 46.35
Amherst	+ 42 22 15.6	− 11 27.5	9.999343	− 0 18 4.8	+ 4 50 7.3
Annapolis	+ 38 58 53.5	− 11 15.0	9.999428	− 0 2 15.60	+ 5 5 56.49
Ann Arbor	+ 42 16 48.0	− 11 27.3	9.999346	+ 0 26 43.10	+ 5 34 55.19
Armagh	+ 54 21 12.7	− 10 54.9	9.999043	− 4 41 36.6	+ 0 26 35.5
Athens	+ 37 58 20.0	− 11 9.4	9.999453	− 6 43 7.8	− 1 34 55.7
Berlin	+ 52 30 16.7	− 11 7.7	9.999088	− 6 1 47.00	− 0 53 34.91
Berne	+ 46 57 8.7	− 11 29.2	9.999227	− 5 37 58.1	− 0 29 46.0
Bethlehem	+ 40 36 23.9	− 11 22.2	9.999388	− 0 6 40.19	+ 5 1 31.90
Birr Castle	+ 53 5 47.0	− 11 3.9	9.999074	− 4 36 31.2	+ 0 31 40.9
Bologna	+ 44 29 47.0	− 11 30.5	9.999289	− 5 53 36.7	− 0 45 24.6
Bonn	+ 50 43 45.0	− 11 17.3	9.999132	− 5 36 35.38	− 0 28 23.29
Bothkamp	+ 54 12 9.6	− 10 56.0	9.999047	− 5 48 42.9	− 0 40 30.8
Breslau	+ 51 6 56.5	− 11 15.4	9.999122	− 6 16 20.80	− 1 8 8.71
Brussels	+ 50 51 10.5	− 11 16.8	9.999129	− 5 25 40.7	− 0 17 28.6
Cambridge (*Eng.*) . .	+ 52 12 51.6	− 11 9.4	9.999095	− 5 8 34.84	− 0 0 22.75
Cambridge (*Mass.*). .	+ 42 22 48.3	− 11 27.6	9.999343	− 0 23 41.11	+ 4 44 30.98
Cape of Good Hope .	− 33 56 3.2	+ 10 39.0	9.999550	− 6 22 7.1	− 1 13 55.0
Charkow	+ 50 0 10.2	− 11 20.5	9.999150	− 7 33 6.8	− 2 24 54.7
Chicago	+ 41 50 1.0	− 11 26.2	9.999357	+ 0 42 14.69	+ 5 50 26.78
Christiania	+ 59 54 43.7	− 10 0.2	9.998914	− 5 51 5.94	− 0 42 53.85
Cincinnati (*New Obs.*).	+ 39 8 35.5	− 11 15.8	9.999424	+ 0 29 29.33	+ 5 37 41.42
Cincinnati (*Old Obs.*).	+ 39 6 26.5	− 11 15.6	9.999425	+ 0 29 46.85	+ 5 37 58.94
Clinton	+ 43 3 17.0	− 11 28.9	9.999326	− 0 6 34.65	+ 5 1 37.44
Coimbra	+ 40 12 25.8	− 11 20.6	9.999398	− 4 34 37.6	+ 0 33 34.5
Copenhagen	+ 55 41 13 6	− 10 43.9	9.999011	− 5 58 31.3	− 0 50 19.2
Cordova	− 31 25 15.4	+ 10 13.5	9.999608	− 0 51 27.0	+ 4 16 45.1
Cracow	+ 50 3 50.0	− 11 20.3	9.999149	− 6 28 2.6	− 1 19 50.5
Dantzig	+ 54 21 18.0	− 10 54 9	9.999043	− 6 22 51.4	− 1 14 39.3
Dorpat.	+ 58 22 47.4	− 10 17.6	9.998948	− 6 55 5.6	− 1 46 53 5
Dublin.	+ 53 23 13	− 11 1.9	9.999066	− 4 42 50	+ 0 25 22
Dun Echt	+ 57 9 36	− 10 30.2	9.998977	− 4 58 32.1	+ 0 9 40.0
Durham	+ 54 46 6.2	− 10 51.6	9.999033	− 5 1 52.3	+ 0 6 19.8
Düsseldorf	+ 51 12 25	− 11 15.0	9.999120	− 5 35 17	− 0 27 5
Edinburgh	+ 55 57 23.2	− 10 41.5	9.999005	− 4 55 29.04	+ 0 12 43.05
Florence	+ 43 46 4.1	− 11 29.9	9.999308	− 5 53 13.6	− 0 45 1.5
Geneva	+ 46 11 58.8	− 11 30.1	9.999246	− 5 32 49.2	− 0 24 37.1
Georgetown	+ 38 54 26.2	− 11 14.6	9.999430	+ 0 0 6.20	+ 5 8 18.29
Glasgow (*Missouri*) .	+ 39 16 16.8	− 11 16.4	9.999421	+ 1 3 6.8	+ 6 11 18.9
Glasgow (*Scotland*) .	+ 55 52 42.8	− 10 42.2	9.999006	− 4 51 1.5	+ 0 17 10.6
Gotha	+ 50 56 37.5	− 11 16.3	9.999127	− 5 51 2.62	− 0 42 50.53

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Göttingen	+ 51 31 47.9	− 11 13.3	9.999112	− 5 47 58.33	− 0 39 46.24
Greenwich	+ 51 28 38.4	− 11 13.6	9.999113	− 5 8 12.09	0 0 0
Hamburg	+ 53 33 7.0	− 11 0.8	9.999062	− 5 48 5.8	− 0 39 53.7
Hanover	+ 43 42 15	− 11 29.8	9.999309	− 0 19 4.13	+ 4 49 7.96
Hastings-on-Hudson .	+ 40 59 25	− 11 23.6	9.999378	− 0 12 42.4	+ 4 55 29.7
Haverford	+ 40 0 36.5	− 11 19.8	9.999402	− 0 6 59.34	+ 5 1 12.75
Helsingfors	+ 60 9 43.3	− 9 57.1	9.998909	− 6 48 1.25	− 1 39 49.16
Hudson	+ 41 14 42.6	− 11 24.4	9.999371	+ 0 17 32.06	+ 5 25 44.15
Kasan	+ 55 47 24.2	− 10 43.0	9.999009	− 8 24 41.0	− 3 16 28.9
Kew	+ 51 28 6	− 11 13.6	9.999114	− 5 6 57.0	+ 0 1 15.1
Kiel	+ 54 20 29.7	− 10 55.0	9.999043	− 5 48 47.85	− 0 40 35.76
Kiew	+ 50 27 11.1	− 11 18.6	9.999139	− 7 10 12.73	− 2 2 0.64
Königsberg	+ 54 42 50.6	− 10 52.0	9.999034	− 6 30 11.00	− 1 21 58.91
Kremsmünster . . .	+ 48 3 23.7	− 11 27.0	9.999199	− 6 4 44.3	− 0 56 32.2
Leiden	+ 52 9 20.0	− 11 9.8	9.999097	− 5 26 8.44	− 0 17 56.35
Leipzig	+ 51 20 6.3	− 11 14.3	9.999117	− 5 57 46.11	− 0 49 34.02
Leyton	+ 51 34 34	− 11 13.0	9.999111	− 5 8 11.22	+ 0 0 0.87
Lisbon (*Marine Obs.*) .	+ 38 42 17.6	− 11 13.5	9.999435	− 4 31 47.1	+ 0 36 25.0
Lisbon (*Royal Obs.*) .	+ 38 42 31.3	− 11 13.6	9.999435	− 4 31 36.0	+ 0 36 36.1
Liverpool	+ 53 24 4	− 11 1.8	9.999066	− 4 55 54.9	+ 0 12 17.2
Lübec	+ 53 51 31.2	− 10 58.6	9.999055	− 5 50 57.64	− 0 42 45.55
Lund	+ 55 41 52.1	− 10 43.8	9.999011	− 6 0 57.11	− 0 52 45.02
Madison	+ 43 4 33	− 11 28.9	9.999325	+ 0 49 24.1	+ 5 57 36.2
Madras	+ 13 4 8.1	− 5 3.3	9.999926	− 10 29 11.5	− 5 20 59.4
Madrid	+ 40 24 30.0	− 11 21.4	9.999393	− 4 53 26.7	+ 0 14 45.4
Manheim	+ 49 29 11.0	− 11 22.5	9.999163	− 5 42 2.61	− 0 33 50.52
Marburg	+ 50 48 46.9	− 11 16.9	9.999130	− 5 43 17.1	− 0 35 5.0
Markree	+ 54 10 31.8	− 10 56.2	9.999047	− 4 34 23.7	+ 0 33 48.4
Marseilles	+ 43 18 19.1	− 11 29.3	9.999320	− 5 29 46.73	− 0 21 34.64
Melbourne	− 37 49 53.3	+ 11 8.6	9.999456	− 14 48 6.9	− 9 39 54.8
Mexico	+ 19 26 1	− 7 12.2	9.999840	+ 1 28 14.5	+ 6 36 26.6
Milan	+ 45 27 59.2	− 11 30.6	9.999265	− 5 44 58.06	− 0 36 45.97
Modena	+ 44 38 52.8	− 11 30.6	9.999285	− 5 51 54.9	− 0 43 42.8
Montsouris	+ 48 49 18.0	− 11 24.8	9.999180	− 5 17 32.77	− 0 9 20.68
Moscow	+ 55 45 19.8	− 10 43.3	9.999009	− 7 38 29.0	− 2 30 16.9
Munich	+ 48 8 45.5	− 11 26.7	9.999197	− 5 54 38.22	− 0 46 26.13
Naples	+ 40 51 45.4	− 11 23.1	9.999381	− 6 5 13.0	− 0 57 0.9
Neuchatel	+ 46 59 51.0	− 11 29.1	9.999226	− 5 36 2.3	− 0 27 50.2
New Haven	+ 41 18 36.5	− 11 24.6	9.999370	− 0 16 29.90	+ 4 51 42.19
New York (*Columb. Coll.*)	+ 40 45 23.1	− 11 22.7	9.999384	− 0 12 18.40	+ 4 55 53.69
New York (RUTHERFURD)	+ 40 43 48.5	− 11 22.6	9.999384	− 0 12 15.47	+ 4 55 56.62
Nicolaeff	+ 46 58 20.6	− 11 29.2	9.999226	− 7 16 6.2	− 2 7 54.1
Odessa	+ 46 28 36	− 11 29.8	9.999239	− 7 11 14.4	− 2 3 2.3
Ogden	+ 41 13 8.6	− 11 24.3	9.999372	+ 2 19 47.52	+ 7 27 59.61
Ó-Gyalla	+ 47 52 43.4	− 11 27.4	9.999204	− 6 20 57.68	− 1 12 45.59
Olmütz	+ 49 35 43	− 11 22.1	9.999160	− 6 17 14.7	− 1 9 2.6
Oxford (*Radcliffe*) . .	+ 51 45 36.0	− 11 12.0	9.999106	− 5 3 9.5	+ 0 5 2.6

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude From Washington.	Longitude From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Oxford (*University*)	+ 51 45 34.2	− 11 12.0	9.999106	− 5 3 11.69	+ 0 5 0.40
Padua	+ 45 24 2.5	− 11 30.6	9.999266	− 5 55 41.22	− 0 47 29.13
Palermo	+ 38 6 44.0	− 11 10.2	9.999449	− 6 1 37.2	− 0 53 25.1
Paramatta	− 33 48 49.8	+ 10 37.8	9.999553	−15 12 18.3	−10 4 6.2
Paris	+ 48 50 11.8	− 11 24.8	9.999179	− 5 17 33.11	− 0 9 21.02
Philadelphia	+ 39 57 7.5	− 11 19.5	9.999404	− 0 7 33.64	+ 5 0 38.45
Pola	+ 44 51 49.0	− 11 30.6	9.999280	− 6 3 35.27	− 0 55 23.18
Potsdam	+ 52 22 56	− 11 8.4	9.999091	− 6 0 29	− 0 52 17
Poughkeepsie	+ 41 41 18	− 11 25.8	9.999360	− 0 12 38.5	+ 4 55 33.6
Prague	+ 50 5 18.8	− 11 20.2	9.999148	− 6 5 53.5	− 0 57 41.4
Princeton	+ 40 20 58	− 11 21.2	9.999394	− 0 9 34.6	+ 4 58 37.5
Pulkowa	+ 59 46 18.7	− 10 1.8	9.998917	− 7 9 30.76	− 2 1 18.67
Rio de Janeiro	− 22 53 51.0	+ 8 13.9	9.999782	− 2 15 36	+ 2 52 36
Rome	+ 41 53 53.7	− 11 26.3	9.999355	− 5 58 6.79	− 0 49 54.70
San Fernando	+ 36 27 41.5	− 10 59.5	9.999490	− 4 43 22.5	+ 0 24 49.6
Santiago de Chile	− 33 26 42.0	+ 10 34.4	9.999561	− 0 25 29 7	+ 4 42 42.4
Schwerin	+ 53 37 38.2	− 11 0.2	9.999061	− 5 53 52.8	− 0 45 40.7
Senftenberg	+ 50 5 10.1	− 11 20.2	9.999148	− 6 14 2.7	− 1 5 50.6
Speier	+ 49 18 55.4	− 11 23.2	9.999167	− 5 41 57.7	− 0 33 45.6
Stockholm	+ 59 20 34.0	− 10 6.9	9.998927	− 6 20 26.09	− 1 12 14.00
Stonyhurst	+ 53 50 40	− 10 58.7	9.999055	− 4 58 19.41	+ 0 9 52.68
St. Petersburg	+ 59 56 29.7	− 9 59.8	9.998913	− 7 9 25.6	− 2 1 13.5
Strassburg (*New Obs.*)	+ 48 34 59.7	− 11 25.5	9.999186	− 5 39 16.79	− 0 31 4.70
Strassburg (*Old Obs.*)	+ 48 34 53.8	− 11 25.5	9.999186	− 5 39 14.63	− 0 31 2.54
Sydney	− 33 51 41.1	+ 10 38.3	9.999552	−15 13 2.7	−10 4 50.6
Toulouse	+ 43 36 47	− 11 29.7	9.999312	− 5 14 3.2	− 0 5 51.1
Turin	+ 45 4 6.0	− 11 30.7	9.999275	− 5 39 0.5	− 0 30 48.4
Twickenham	+ 51 27 4.2	− 11 13.7	9.999114	− 5 6 59.0	+ 0 1 13.1
Upsala	+ 59 51 31.5	− 10 0.8	9.998915	− 6 18 42.7	− 1 10 30.6
Utrecht	+ 52 5 10.5	− 11 10.2	9.999098	− 5 28 43.8	− 0 20 31.7
Venice	+ 45 25 49.5	− 11 30.6	9.999266	− 5 57 37.5	− 0 49 25.4
Vienna (*Josephstadt*)	+ 48 12 53.8	− 11 26.6	9.999195	− 6 13 37.4	− 1 5 25.3
Vienna (*Old Obs.*)	+ 48 12 35.5	− 11 26.6	9.999195	− 6 13 43.83	− 1 5 31.74
Warsaw	+ 52 13 5.7	− 11 9.4	9.999095	− 6 32 19.5	− 1 24 7.4
Washington	+ 38 53 38.8	− 11 14.5	9.999430	0 0 0	+ 5 8 12.09
West Point	+ 41 23 31	− 11 24.9	9.999368	− 0 12 22.71	+ 4 55 49.38
Wilhelmshaven	+ 53 31 52.0	− 11 0.9	9.999063	− 5 40 47.30	− 0 32 35.21
Williamstown (*Mass.*)	+ 42 42 49	− 11 28.3	9.999334	− 0 15 18.6	+ 4 52 53.5
Williamstown (*Victoria*)	− 37 52 7.2	+ 11 8.8	9.999455	−14 47 50.9	− 9 39 38.8
Wilna	+ 54 41 0	− 10 52.3	9.999035	− 6 49 24.0	− 1 41 11.9
Windsor	− 33 36 28.9	+ 10 35.9	9.999558	−15 11 33.8	−10 3 21.7
Zürich	+ 47 22 40.0	− 11 28.5	9.999216	− 5 42 24.7	− 0 34 12.6

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

The greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of equinoxes, etc.

TIME.

Astronomers make use of several different kinds of time: mean solar time; true, or apparent solar time; and sidereal time.

Solar Time.—Solar time is that used for all the ordinary purposes of life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth round the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal, it is impossible to regulate a clock or chronometer so that it shall follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called a *Mean Sun*, is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time. Mean solar time is commonly called *Mean Time*, simply.

True, or *Apparent Solar Time* is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time.* By means of it we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. This point is the vernal equinox, and its hour angle is called *Sidereal Time.* Astronomical clocks, regulated to sidereal time, are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is about $3^m 56^s$ shorter than the mean solar day; 365¼ solar days, or a year, being divided into 366¼ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock; and it gains on it about $3^m 56^s$ per day, so that at the end of a year it will have gained an entire day, and will again agree with it.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each; the first of which is marked A. M., the last is marked P. M.

The *Astronomical Day* commences at noon on the civil day of the same date. It also comprises twenty-four hours; but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h, astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h, astronomical time. The rule, then, for the transformation of civil time into astronomical time is this:—If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 hours. If greater than 12 hours, we subtract 12 hours from it, add one to the days, and write A. M. For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M., civil time.

If the longitude from Greenwich be expressed in time, and, when *west*, *added* to the local time, or, when *east*, *subtracted* from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months; and to each month are assigned eighteen pages, the contents of which are as follow:—

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when great accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is $0^h\ 0^m\ 0^s$. The longitude from Greenwich expressed in time, if west, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if east, it is time before

Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at that place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declination of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I: —

Let the sun's declination be required at noon, 1882, May 30th, at a place whose longitude is 180° 20′ W., or $12^h\,1^m\,20^s$.

		h	m	s
Local apparent time . . .	May 30,	0	0	0
Longitude from Greenwich (additive) . . .		12	1	20
Greenwich apparent time . . .	May 30,	12	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $12^h.022$ after Greenwich apparent noon on May 30th, or $11^h.978$ before Greenwich apparent noon on May 31st.

On page 74 of the Ephemeris we find that the change of declination in one hour is

	″
May 30, at Greenwich apparent noon . . .	22.16
May 31, at Greenwich apparent noon . . .	21.21
Difference for one day	0.95

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 30th, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follows: —

	″
Difference for one hour, May 30	22.16
Change for one day (or $0''.95$) × 0.25 . . .	0.24
Difference at 6 hours after noon	21.92

$$21''.92 \times 12.022 = 263''.5 = 4'\,23''.5$$

	° ′ ″
Declination at Greenwich noon, May 30 . . .	N. 21 47 58.4
Change in 12.022 hours (additive) . . .	4 23.5
Sun's declination at time of observation . . .	N. 21 52 21.9

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $11^h.978$ before Greenwich noon of May 31st; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is $21''.45$. Then, we find: —

	° ′ ″
Declination at Greenwich noon, May 31 . .	N. 21 56 38.9
Product of $21''.45 \times 11.978 = 256''.9$ (subtractive) .	4 16.9
Sun's declination at time of observation . . .	N. 21 52 22.0

It will always be well to make the calculation by both methods, as their agreement will show both to be right. In the above example, the results differ by only $0''.1$, a quantity too small to be considered an error.

At sea it is ordinarily sufficient to have the declination to the nearest half minute; and the reduction may be found by Table V of Bowditch's *American Practical Navigator*.

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour angle of the mean sun at that instant.

The Sun's Semidiameter, and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the centre; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the centre of the sun. The sidereal time of semidiameter passing meridian is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon.* The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first interpolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

The right ascension and declination on pages I and II are affected by aberration, and therefore denote the apparent position of the true sun. Page II is more conveniently used when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and in general it is the hour angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table LI of Bowditch's *Navigator* may be used for the same purpose when only the nearest quarter of a second is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained: this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table LII of Bowditch's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^s.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II:—

1.—Let the sun's right ascension and the equation of time be required for 1882, May 15th, $9^h\ 2^m\ 30^s$, A. M., mean time, at a place whose longitude is 100° 10′, W., or $6^h\ 40^m\ 40^s$.

		h	m	s
Local astronomical mean time . . .	May 14,	21	2	30
Longitude from Greenwich (additive)		6	40	40
Greenwich mean time	May 15,	3	43	10 = $3^h.7195$.

Sun's Right Ascension.	h	m	s
May 15, Greenwich noon .	3	28	34.17
H. D. $9^s.881 \times 3.7195$.	+	0	36.75
	3	29	10.92

Equation of Time.	m	s	
May 15, noon . .	3	52.54	(additive).
H. D. — $0^s.024 \times 3.72$.	—	0.09	
	3	52.45	

In this case, the hourly differences interpolated to half the interval, or $1^h.9$ after noon, have been used. The equation of time in this example is additive to mean time. Its reduction could also have been found by Table VI, A., of BOWDITCH's *Navigator*, to seconds only.

2.—If the sidereal time is required for the same date and time, we have:—

	h	m	s
May 15, Sidereal Time (at Greenwich mean noon). . . .	3	32	26.71
Hourly Difference $9^s.8565 \times 3.7195$	+	0	36.66
Add the local astronomical mean time	21	2	30.00
The required sidereal time is (rejecting 24^h) . . .	0	35	33.37

The reduction $0^m\ 36^s.66$ could have been found in Table III corresponding to the Greenwich mean time $3^h\ 43^m\ 10^s$. Also, by Table LI of BOWDITCH's *Navigator*, the reduction is $0^m\ 36^s.7$.

3.—On 1882, May 15, A. M., at a place whose longitude is 100° 10′ W., suppose the sidereal time to be $0^h\ 35^m\ 33^s.37$, and that the corresponding mean time is required.

The astronomical day is May 14; the longitude in time, $+6^h\ 40^m\ 40^s$, or $+6^h.678$.

	h	m	s
May 14, Sidereal Time (at Greenwich mean noon)	3	28	30.15
The H. D. $9^s.8565 \times 6.678$, or the reduction for $6^h\ 40^m\ 40^s$ in Table III .	+	1	5.82
The sidereal time of local mean noon	3	29	35.97
The given sidereal time ($+24^h$, if necessary for the following subtraction)	24	35	33.37
Subtracting the first from the second gives the sidereal interval from noon .	21	5	57.40 $= 21^h.0993$
— $9^s.8296 \times 21.0993$, or the reduction for $21^h\ 5^m\ 57^s$ in Table II . .	—	3	27.40
The required astronomical mean time is . . May 14,	21	2	30.00

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude*, and *Latitude*, and the *Logarithm of the Radius Vector of the Earth.* The longitude is given in two columns, headed λ and λ'; λ representing the sun's longitude counted from the true equinox of the date; and λ', the same co-ordinate counted from the mean equinox of the beginning of the year, (January $0^d.0$). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The longitudes of the sun are the true longitudes, not corrected for aberration. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, $-9^s.8296$. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or, approximately, from Table LII of BOWDITCH's *Navigator.*

This column may be used in converting sidereal time to mean time instead of that on page II As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is not greater than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 13, that is the preceding astronomical day.

	h	m	s
May 14, the mean time of Greenwich sidereal noon is . .	20	28	8.10
The H. D. — $9^s.8296 \times 6.678$, or the reduction for long., Table II	—	1	5.64
The mean time of local sidereal noon	20	27	2.46
Add the given sidereal time	0	35	33.37 $= 0^h.593$
The sum is	21	2	35.83
— $9^s.8296 \times 0.593$, or the reduction for $0^h\ 35^m\ 33^s$ in Table II .	—	0	5.83
The required astronomical mean time . . May 14,	21	2	30.00

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of BOWDITCH's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1882, May 1, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of May 1 is 3″.9; then,

$$\text{as } 12^h : 10^h = 3''.9 : 3''.2,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The moon's semidiameter then, for May 1, 10^h, is 15′ 4″.0 + 3″.2, or 15′ 7″.2.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude turned into time, the local time of the moon's meridian passage at any other place may be computed. The reduction may be taken from BOWDITCH's Table XXVIII by simple inspection. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension* and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude, turned into time, to the local mean time of the observer. The right ascension, or declination, is taken out for the day and hour of the Greenwich mean time; the *Diff. for 1m.* multiplied by the minutes and parts of a minute of the Greenwich time; and the product added to, or subtracted from, the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1882, May 1, 10^h 10^m 30^s, astronomical mean time at Greenwich:—

	Right Ascension.		*Declination.*
	h m s		° ′ ″
May 1, 10^h	13 26 50.22		S. 12 22 8.4
Diff. 2^s.0277 × 10.500 . .	= + 21.29	9″.334 × 10.500	= 1 38.0
May 1, 10^h 10^m 30^s . . .	13 27 11.51		S. 12 23 46.4

The differences interpolated for 5^m.2 = 0^h.09 are for the right ascension 2^s.0281, and for the declination 9″.330, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east, side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true, or geocentric, distance; that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1″; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearest of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time,* given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1882, May 9, about 6$^{\text{h}}$ of Greenwich mean time, the corrected distance of the moon's centre from that of the sun is 99° 12′ 30″:—

Corrected distance	99°	12′	30″		
Distance in the Ephemeris, May 9, VI$^{\text{h}}$	100	9	34	P. L.	0.2638
Difference	0	57	4	P. L.	0.4989
	h	m	s	P. L.	0.2351
Time from VI$^{\text{h}}$ (after)	+1	44	45		
Corr. for 2d Diff., Table I	+		2		
Greenwich mean time, May 9	7	44	47		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

From Ephemeris	P. L.	0.2638
Diff. of distances, $57' 4'' = 3424''$	log	3.5345
Red. of Greenwich time, $+ 1^h 44^m 45^s = 6285^s$ . . .	log	3.7983

The result is the same as by the previous method.

Pages 218—249 contain the ephemerides of the seven major planets. The position of each planet is the geocentric one referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily difference by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product may be subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The two last columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* 0 give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 409.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (HANSEN) gives the true inclination of the earth's equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, as in the year 1882, the true longitudes are greater than those referred to the mean equinox. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude* from January 0 to each of the following dates. *The Sun's Aberration* is the quantity which has been applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The sun's equatorial horizontal parallax, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for the reduction of the positions of the fixed stars, using the notation of BESSEL, and the constants of PETERS and STRUVE. The formulæ by which the star numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star Numbers*, A, B, C, D, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities A and B must be interchanged with the pair C and D; that is A must be interchanged with C, and B with D. In the first column along with the solar day is given the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star numbers:—

Computation of the apparent place of α Lyræ for 1882, *November* 10, *for the upper transit at Washington.*

(Star Catalogue)	$\log a$	0.304	$\log b$	7.884	$\log c$	8.088	$\log d$	8.927 *n*
(Page 284)	$\log A$	0.040	$\log B$	0.771	$\log C$	1.096	$\log D$	1.183
(Star Catalogue)	$\log a'$	0.460	$\log b'$	9.995	$\log c'$	9.981	$\log d'$	8.955
	$\log Aa$	0.344	$\log Bb$	8.655	$\log Cc$	9.184	$\log Dd$	0.110 *n*
	$\log Aa'$	0.500	$\log Bb'$	0.766	$\log Cc'$	1.077	$\log Dd'$	0.138

		h m s		° ′ ″
Mean Place, 1882.0,	$\alpha_0 =$	18 32 56.615	$\delta_0 =$	+ 38 40 28.11
	$Aa =$	+ 2.208	$Aa' =$	+ 3.16
	$Bb =$	+ 0.045	$Bb' =$	+ 5.83
	$Cc =$	+ 0.153	$Cc' =$	+ 11.94
	$Dd =$	− 1.288	$Dd' =$	+ 1.37
	$E =$	+ 0.001	$\tau\mu' =$	+ 0.23
	$\tau\mu =$	+ 0.016		
Apparent Place, 1882, *Nov.* 10,	$\alpha =$	18 32 57.75	$\delta =$	+ 38 40 50.6

Pages 285—292 contain the *Independent Star Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of BESSEL by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star constants, a, b, c, d, a', b', c', d'. The independent star numbers are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star numbers:—

Computation of the apparent place of a Lyræ for 1882, *November* 10, *for the upper transit at Washington.*

	$\alpha_0 = 18^{h}\ 32^{m}.9$				$\delta_0 = +38^{\circ}\ 40'.5$
	$G = 1\ \ 0.1$			$G+\alpha =$	$19^{h}\ 33^{m}.0$
	$H = 2\ 37.0$			$H+\alpha =$	$21\ \ 9.9$
$\log \frac{1}{15}$	8.824	$\log \frac{1}{15}$	8.824		$^{h}\ \ ^{m}\ \ ^{s}$
$\log g$	1.358	$\log h$	1.295	α_0	$=$ 18 32 56.615
$\log \sin (G+\alpha)$	9.963 *n*	$\log \sin (H+\alpha)$	9.830 *n*	f	$=$ + 3.374
$\log \tan \delta$	9.903	$\log \sec \delta$	0.108	(g)	$=$ − 1.117
$\log (g)$	0.048 *n*	$\log (h)$	0.057 *n*	(h)	$=$ − 1.140
				$\tau \mu$	$=$ + 0.016
		Apparent Right Ascension			$=$ 18 32 57.75
$\log g$	1.358	$\log h$	1.295		$^{\circ}\ \ '\ \ ''$
$\log \cos (G+\alpha)$	9.596	$\log \cos (H+\alpha)$	9.868	δ_0	$= +$ 38 40 28.11
$\log (g')$	0.954	$\log \sin \delta$	9.796	(g')	+ 9.00
		$\log (h')$	0.959	(h')	+ 9.10
$\log i$	0.733			(i)	+ 4.23
$\log \cos \delta$	9.893			$\tau \mu'$	+ 0.23
$\log (i)$	0.626				
		Apparent Declination			$= +$ 38 40 50.7

Pages 293—301 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1882, or the moment when the sun's mean longitude is 280°.

The annual variations are to be considered as the differential co-efficients of each co-ordinate in respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate, one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expressions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90°. The method of obtaining the time of observation and setting of the circle in order to find a star on the meridian is then uniform for all the stars.

In this volume, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. The apparent places are not, however, given for the stars now added for the first time. In order to show at a glance these additional stars, they are indicated in the list by an asterisk.*

Pages 302—313 contain the apparent positions of the four north polar stars, *a*, *δ*, and *λ* Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Day*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But, the lower transit following that of July 1st does not take place until July 3.2. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very

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*** It is contemplated to issue, if practicable, a supplement to the Ephemeris for this year, containing either apparent right ascensions of these additional stars or general tables by which these right ascensions may be readily computed.**

nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of mean solar date.

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential co-efficient corresponding to the dates for which the star places are given.

Pages 365—372 contain the apparent right ascension and declination of the sun, as derived from HANSEN's tables, for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The equation of time for apparent noon is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the Ephemeris for the meridian of Greenwich.

Pages 373—380 contain the position, semidiameter and parallax of the moon at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 381—397 contain the geocentric positions of the seven major planets, for the moments of all those transits over the meridian of Washington which can be observed.

PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses, the Transit of Venus, and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 400—404 inclusive contain the elements necessary for computing the two eclipses of the sun which occur during the year.

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour during the eclipse. The principal circumstances of each eclipse are as follow:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central Eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central Eclipse at Noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point the eclipse will be central at the moment of apparent noon.

"Central Eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the time of beginning and ending and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1882, May 16th, begins at Paris. We find this city to be situated between the lines 18 hours and 19 hours at a point which we may roughly estimate as one-twentieth of the distance from the former line to the latter. We conclude, therefore, that the eclipse begins about one-twentieth of an hour after 18 hours, or at 18 hours 3 minutes Greenwich mean time. Applying 9 minutes for longitude, the Paris mean time will be 18 hours 12 minutes, a time which is probably correct within 2 or 3 minutes. We find in the same way that the ending is between 19 and 20 hours. Measured in distance on the map, the city is twice as far from 19 hours as it is from 20 hours. On the other hand, the lesser distance from 20 hours to 21 hours shows that the spaces represented by equal intervals of time are growing shorter and shorter. Making allowance for this change, we may estimate the time of ending at 19 hours 25 minutes, Greenwich mean time, and 19 hours 34 minutes, local mean time. Owing to the uncertainty, this time may be 5 minutes or more in error.

A rough idea of the magnitude of the eclipse may be obtained by the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total; while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements, which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth and perpendicular to a right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane.* We take the intersection of this plane with that of the earth's equator as the axis of X, the axis of Y being perpendicular and directed toward the north. x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVE-

NET's *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total eclipse.

The angles f and f', the tangents of which are given, are the angles which each element of the respective shadow-cones makes with the axis of the shadow; or, they are the semi-angle of the cone.

At the bottom of the table are given the logarithms of the change of x, y and μ, in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised that the moments of beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. We compute—

(1) The co-ordinates, ξ, η, and ζ, of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(4) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to its radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$
$$\rho \sin \varphi' = G \sin \varphi$$

φ being, as usual, the geographic latitude.

TABLE FOR COMPUTING THE GEOCENTRIC CO-ORDINATES OF A PLACE.

φ	log F.		log G.	
0°	+ 0.00000		− 0.00302	
		1		2
5	0.00001		0.00300	
		4		3
10	0,00005		0.00297	
		5		5
15	0 00010		0.00292	
		8		8
20	0.00018		0.00284	
		9		9
25	+ 0.00027		− 0.00275	
		11		11
30	0.00038		0.00264	
		12		12
35	0.00050		0.00252	
		12		13
40	0.00062		0.00239	
		13		13
45	0.00075		0.00226	
		13		13
50	+ 0.00088		− 0.00213	
		13		12
55	0.00101		0.00201	
		12		12
60	0.00113		0.00189	
		11		11
65	0.00124		0.00178	
		9		9
70	0.00133		0.00169	
		8		8
75	+ 0.00141		− 0.00161	
		5		6
80	0.00146		0.00155	
		4		3
85	0.00'50		0.00152	
		1		1
90	+ 0.00151		− 0.00151	

For the assumed Greenwich mean time of computation take from the table of elements, pages 403 or 405, the values of sin d, cos d, and μ. The required co-ordinates of the observer will then be:—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda) \quad (\lambda = \text{longitude of station west of Greenwich.})$$

$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda)$$

$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)$$

and their variations in one minute of mean time will be:—

$$\xi' = [7.6398]\ \rho \cos \varphi' \cos (\mu - \lambda)$$

$$\eta' = [7.6398]\ \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.6398]\ \xi \sin d$$

ζ' is not wanted.

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y'. Their logarithms are given at the foot of the tables.

(3) The distance m and position angle M of the axis of the shadow, and the relative motions, n and N, are computed by the formulæ:—

$$m \sin M = x - \xi$$

$$m \cos M = y - \eta$$

$$n \sin N = x' - \xi'$$

$$n \cos N = y' - \eta'$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formulæ

$$L = l - \zeta \tan f$$

L and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus. Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when sin ψ is positive, and one in the third and the other in the fourth when sin ψ is negative. The correction τ to the assumed time will be found in minutes, from

$$\tau = \frac{L \cos \psi}{n} - \frac{m \cos (M - N)}{n}.$$

There will be two values of τ corresponding to the two values of ψ, the algebraically smaller of which being applied to the assumed time, will give the time of beginning; and the other, the time of ending.

One such pair of values cannot, however, give the time of both beginning and ending with accuracy. To attain accuracy it is necessary to assume two times, one as near as practicable to that of beginning, and another near that of ending. These approximate times may be derived from the chart. We shall thus have two pairs of values of τ. The computation for the first assumed time will give a small and more accurate value for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and accurate value for the end, and a large negative and inaccurate one for the beginning. We shall thus deduce two times of beginning and two of ending, of each of which only one is to be considered approximately accurate.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

The error of each result is approximately proportional to the square of the correction τ, multiplied by the sine of the sun's hour angle, $(\mu - \lambda)$, for the middle of the interval between the time of computation and that of the phase. We therefore find the two values of $\tau^2 \sin(\mu - \lambda)$, the ratio of which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate results in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^{\mathrm{m}}.001\,\tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, farther corrections may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

As an example of the computation, we shall compute the four principal phases of the total eclipse of 1882, May 16, for a point near the Nile, in the following position:—

Latitude, $\varphi = +26° \; 40'$
Longitude, $\lambda = -31 \;\; 53$.

The constants for the place are computed thus:—

log sin φ	9.65205	log cos φ	9.95116
log G	−0.00271	log F	+0.00031
log ρ sin φ'	9.64934	log ρ cos φ'	9.95147

From the chart and the table on page 402 we find approximate times of the phases as follows:—

	h	m	
Beginning,	17	20	Greenwich Mean Time.
Total phase,	18	25	
Ending,	19	50	

	Beginning.	Total Phase.	Ending.
	h m	h m	h m
Greenwich Mean Times	17 20	18 25	19 50
μ	260° 57′.5	277° 12′.6	298° 27′.7
$\mu - \lambda$	292 50.5	309 5.6	330 20.7
sin d	9.51930	9.51952	9.51980
cos d	9.97487	9.97484	9.97481
sin $(\mu - \lambda)$	−9.96454	−9.88993	−9.69441
ρ cos φ' sin d	9.47077	9.47099	9.47127
cos $(\mu - \lambda)$	9.58904	9.79975	9.93903
ρ cos φ' cos d	9.92634	9.92631	9.92628
log ξ	−9.91601	−9.84140	−9.64588
log ρ cos φ' sin d cos $(\mu - \lambda)$	9.05981	9.27074	9.41030
log ρ sin φ' cos d	9.62421	9.62418	9.62415

		Beginning.	Total Phase.	Ending.
		h m	h m	h m
Greenwich Mean Times		17 20	18 25	19 50
	$\log \rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.51538	9.72606	9.86531
	$\log \rho \sin \psi' \sin d$	9.16864	9.16886	9.16914
	$\log \xi'$	7.1803	7.3910	7.5303
	$\log \eta'$	− 7.0751	− 7.0007	− 6.8055
	ξ	− 0.82416	− 0.69407	− 0.44247
Table, page 401	x	− 1.28978	− 0.69748	+ 0.07718
	$x - \xi$	− 0.46562	− 0.00341	+ 0.51965
	η	+ 0.30616	+ 0.23437	+ 0.16365
Table, page 401	y	+ 0.15062	+ 0.23336	+ 0.34105
	$y - \eta$	− 0.15554	− 0.00101	+ 0.17740
	$\log \xi$	9.6768	9.8323	9.9450
Table	$\log \tan f$, Penumbra	7.6648	. . . .	7.6648
	$\log \tan f$, Shadow	. . . .	7.6627	. . . .
For Penumbra,	l	0.54464	. . . .	0.54498
	L	0.54244	. . . .	0.54091
For Shadow,	l'	. . . .	− 0.00111	. . . .
	L'	. . . .	− 0.00424	. . . .
	x'	+0.009112	+0.009113	+0.009114
	ξ'	+0.001515	+0.002460	+0.003391
	$x' - \xi'$	+0.007597	+0.006653	+0.005723
	y'	+0.001276	+0.001271	+0.001264
	η'	−0.001189	−0.001002	−0.000639
	$y' - \eta'$	+0.002465	+0.002273	+0.001903
	$\log m \sin M$	− 9.66803	− 7.5328	+ 9.71571
	$\log m \cos M$	− 9.19184	− 7.0043	+ 9.24895
	$\log n \sin N$	7.8806	7.8230	7.7576
	$\log n \cos N$	7.3918	7.3566	7.2795
	M	251° 32′	253° 30′	71° 9′
	N	72 1	71 8	71 36
	$M - N$	179 31	182 22	− 0 27
	$\log L$	9.73435	− 7.6274	9.73313
	$\log \sin (M - N)$	7.926	− 8.616	− 7.895
	$\log m$	9.69100	7.5511	9.73965
	$\log \cos (M - N)$	9.99998	9.9996	9.99999
	$\log n$	7.9023	7.8470	7.9804
	$\log \sin \psi$	7.883	8.543	− 7.901
	$\log \cos \psi$	9.99999	9.9996	9.99999
	$\log \frac{L \cos \psi}{n}$	1.83204	9.7800	1.95272
	$\log \frac{m \cos (M - N)}{n}$	− 1.78868	− 9.7037	+ 1.95924
	$-\frac{m \cos (M - N)}{n}$	+ 61.474	+ 0.505	− 91.042
	$\pm \frac{L \cos \psi}{n}$	± 67.927	± 0.603	± 89.685
	τ_1	− 6.453	− 0.098	− 1.357
	τ_2	+ 129.4	+ 1.108	− 180.7

We note that the values of t_1 for the times of beginning and ending respectively, being applied to the assumed times, give nearly accurate values of the times of those phases, but that these times may receive a slight correction from the comparison with the times given by applying t_2, as just explained. For the time of beginning we have:—

	h	m		h	m
From computation for end,	19	50	$+ t_2 =$	16	49.3
From computation for beginning,	17	20	$+ t_1 =$	17	13.547
Difference between the two results . . .					24.2

Ratio of $t_2 : t_1 = 180.7 : 6.45 = 28.0$; its square $= 784$

$\sin(\mu_1 - \lambda) : \sin(\mu_3 - \lambda) = \sin 311^\circ : \sin 293^\circ = 0.82$

$0.82 \times 784 = 643 : 1 =$ error of t_2 : error of t_1

Error of $t_1 = \frac{t_2 - t_1}{642} = 0^m.038$

Concluded Greenwich mean time of beginning, $+ 17^h\ 13^m.547 + 0^m.038 = 17^h\ 13^m.585$.

For the end of the eclipse, the value of t_1 is so small that the result from t_1 is correct within two or three units in the third place of decimals, and therefore needs no modification. The results are—

	h	m
Time of computation	19	50
Correction, t_1	—	1.357
Concluded Greenwich mean time of ending	19	48.643
For the total phase we find—		
Greenwich mean time of beginning	18	24.902
Greenwich mean time of ending	18	26.108
Duration of totality		1.206

Pages 405—408 give the elements of the Transit of Venus, which will occur 1882, December 6th. They are generally the same as for the eclipses, except that the elements are given for computation by SAFFORD's formulæ instead of those of BESSEL. The theory of these elements is given by Mr. G. W. HILL, in Part II of *Papers Relating to the Transit of Venus in* 1874. The quantities on page 405 and the top of 406 have the same meaning as in the solar eclipses, and can be understood by referring to the explanation of the latter.

The elements A, B, C, μ, E, F, G, H, are those of SAFFORD's method of eclipses, which is developed in CHAUVENET's *Spherical and Practical Astronomy*. The formulæ for using the elements in finding the times of contact at any place on the surface of the earth can be found with the requisite accuracy by the aid of the charts. The directions for using are given on page 408.

Pages 410—446 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'ns from* 1882.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1882 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation in which co-ordinates will be established like those already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having every where the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h		Lat. 72°			Lat. 66°			Lat. 60°			Lat. 54°			Lat. 48°			Lat. 42°			Lat. 36°		
		x'			x'			x'			x'			x'			x'			x'		
		.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10	2	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6	5	6	7
	20	3	3	4	4	5	5	5	6	7	6	7	9	8	9	11	9	10	12	11	12	14
	30	5	5	6	6	7	8	8	9	11	10	11	13	12	13	16	14	16	18	16	18	22
	40	6	7	8	8	9	11	11	12	14	13	15	17	16	18	21	18	21	24	21	24	29
	50	7	8	10	10	11	13	13	15	17	16	19	21	19	22	26	22	26	30	26	30	36
1	0	9	10	11	12	14	16	16	18	21	19	22	26	23	26	31	26	31	36	30	35	42
	10	10	12	13	14	16	18	18	21	24	22	26	30	26	30	36	31	35	42	35	40	48
	20	12	13	15	16	18	21	21	23	27	25	29	34	30	34	40	35	40	47	39	45	54
	30	13	15	17	18	20	23	23	26	30	28	32	37	33	38	45	39	44	52	43	50	59
	40	14	16	18	20	22	25	25	29	33	31	35	41	36	42	49	42	48	57	47	54	64
	50	16	18	20	21	24	28	27	31	36	34	38	44	39	45	53	45	52	61	51	58	68
2	0	17	19	22	23	26	30	29	33	39	36	41	47	42	48	56	48	55	65	54	62	72
	10	18	20	23	25	28	32	31	36	41	38	43	50	45	51	59	51	59	68	57	66	76
	20	19	22	24	26	30	34	33	38	43	40	46	53	47	54	62	54	62	71	60	69	80
	30	20	23	26	28	31	36	35	40	45	42	48	55	50	56	65	57	64	74	63	72	83
	40	21	24	27	29	33	37	37	42	47	44	50	58	52	59	68	59	67	77	65	74	86
	50	22	25	28	30	34	39	38	43	49	46	52	60	54	61	70	61	69	79	68	76	88
3	0	23	26	30	31	35	40	40	45	51	48	54	62	56	63	72	63	71	81	70	79	90
	10	24	27	31	33	36	42	41	46	53	49	56	63	57	65	74	65	73	83	72	81	92
	20	25	28	32	34	38	43	42	47	54	51	57	65	59	66	75	66	74	85	73	82	93
	30	26	29	33	35	39	44	43	49	55	52	58	66	60	67	77	68	76	86	74	83	95
	40	26	29	33	36	40	45	44	50	56	53	59	67	61	69	78	69	77	87	75	84	96
	50	27	30	34	36	41	46	45	51	57	54	60	68	62	70	79	70	78	88	76	85	96
4	0	28	31	35	37	41	47	46	52	58	55	61	69	63	70	79	71	79	89	77	86	97
	10	28	31	35	38	42	47	47	52	59	56	62	70	64	71	80	71	79	89	78	86	97
	20	29	32	36	38	42	48	47	53	59	56	62	70	64	71	80	72	80	89	78	87	97
	30	29	32	36	39	43	48	48	53	60	57	63	71	65	72	81	72	80	90	79	87	97
	40	29	33	37	39	43	49	48	53	60	57	63	71	65	72	81	72	80	89	79	87	97
	50	30	33	37	39	44	49	48	54	60	57	63	71	65	72	81	72	80	89	79	87	96
5	0	30	33	37	39	44	49	49	54	60	57	63	71	65	72	80	72	80	89	78	86	95
	10	30	33	37	40	44	49	49	54	60	57	63	71	65	72	80	72	79	88	78	86	95
	20	30	33	37	40	44	49	49	54	60	57	63	71	65	71	79	72	79	88	78	85	94
	30	30	33	37	40	44	49	49	54	60	57	63	70	64	71	79	71	78	87	77	85	93
	40	30	33	37	39	44	49	48	53	59	56	62	70	64	70	78	70	77	86	76	84	91
	50	30	33	37	39	43	48	48	53	59	56	61	69	63	70	77	70	77	85	75	83	90
6	0	30	33	37	39	43	48	48	52	58	55	61	68	63	69	76	69	76	84	74	82	89
	10	30	33	37	39	43	47	47	52	58	55	60	67	62	68	75	68	75	82	73	80	87
	20	29	32	36	38	42	47	47	51	57	54	60	66	61	67	74	67	73	81	72	79	85
	30	29	32	36	38	42	46	46	51	56	53	59	65	60	66	73	66	72	80	71	78	84
	40	29	32	35	37	41	46	45	50	55	53	58	64	59	65	71	65	71	78	70	76	82
	50	28	31	35	37	40	45	45	49	54	52	57	62	58	63	70	63	69	76	68	74	80
7	0	28	31	34	36	40	44	44	48	53	51	55	61	57	62	68	62	68	75	67	73	78
	10	27	30	34	35	39	43	43	47	52	50	54	60	56	61	67	61	66	73	65	71	76
	20	27	30	33	35	38	42	42	46	51	48	53	58	54	59	65	59	65	71	64	69	74
	30	26	29	32	34	37	41	41	45	49	47	52	57	53	58	63	58	63	69	62	67	71
	40	26	28	31	33	36	40	40	44	48	46	50	55	51	56	62	56	61	67			
	50	25	27	31	32	35	39	39	42	47	45	49	53	50	54	60	54	59	65			
8	0	24	27	30	31	34	38	38	41	45	43	47	52	48	52	58	53	57	63			
	10	24	26	29	30	33	37	36	40	44	42	46	50	47	51	56	52	55	60			
	20	23	25	28	29	32	35	35	38	42	40	44	48	45	49	54						
	30	22	24	27	28	31	34	34	37	41	39	42	46	43	47	52						
	40	21	23	26	27	30	33	33	35	39	37	41	44	41	45	49						
	50	20	22	25	26	28	31	31	34	37	36	39	42	40	43	47						
9	0	19	21	24	25	27	30	30	32	35	34	37	40									
	10	18	20	22	24	26	28	28	31	34	32	35	38									
	20	18	19	21	22	24	27	27	29	32	31	33	36									
	30	16	18	20	21	23	25	25	27	30	29	31	34									
	40	15	17	19	20	22	24	24	26	28	27	29	32									

(Concluded at bottom of next page.)

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

k	Lat. 30°			Lat. 24°			Lat. 18°			Lat. 12°			Lat. 6°			Lat. 0°		
	x′			*x′*			*x′*			*x′*			*x′*			*x′*		
	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	7	8	7	7	9	7	8	9	7	8	10	7	8	10	8	9	11
20	12	14	16	13	14	18	14	16	19	14	16	20	14	17	21	15	18	21
30	17	20	24	19	22	27	20	24	29	21	25	30	21	25	31	22	26	32
40	23	27	32	25	29	36	26	32	39	28	33	40	28	34	41	29	34	42
50	28	33	40	31	36	44	32	39	48	35	40	50	35	42	51	35	42	52
1 0	33	39	47	36	42	52	38	46	56	40	47	59	41	49	60	41	49	61
10	38	45	54	41	48	59	44	52	63	46	54	67	47	56	68	47	56	69
20	43	50	60	46	54	65	49	58	70	52	60	74	53	62	75	53	63	76
30	48	55	66	51	60	71	54	64	76	57	66	79	58	68	81	59	69	82
40	52	60	71	56	65	77	59	69	82	62	72	84	63	73	87	64	74	88
50	56	64	76	60	69	82	64	74	87	66	77	89	68	78	92	68	79	93
2 0	59	68	80	64	73	86	68	78	91	70	81	95	72	83	97	72	83	98
10	62	72	84	67	77	90	71	81	95	74	85	99	75	87	101	76	87	102
20	65	75	87	70	81	94	74	85	99	77	88	103	78	90	105	79	91	106
30	68	78	90	73	84	97	77	88	102	80	91	106	81	93	108	82	94	109
40	71	81	93	76	87	100	80	91	105	83	94	109	84	96	111	85	97	112
50	74	83	96	78	89	102	82	93	107	85	96	111	87	98	113	87	99	114
3 0	76	85	98	80	91	104	84	95	109	87	98	113	89	100	115	89	101	116
10	77	87	99	82	92	106	86	97	111	89	100	114	91	102	116	91	103	117
20	79	89	101	84	94	107	88	99	112	91	102	115	92	104	118	93	104	118
30	80	90	102	85	95	108	89	100	113	92	103	116	94	105	119	94	105	119
40	81	91	103	86	96	109	90	101	114	93	104	117	95	106	119	95	106	120
50	82	92	104	87	97	110	91	101	114	94	104	118	95	106	120	96	107	120
4 0	83	92	104	88	98	110	92	102	114	94	105	118	96	107	120	97	107	120
10	84	93	104	88	98	110	92	102	114	95	105	118	96	107	120	97	107	120
20	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	120
30	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	119
40	84	93	104	89	98	109	92	102	113	95	104	116	96	106	118	97	107	119
50	84	93	103	88	97	108	92	101	113	94	104	115	96	106	117	96	106	118
5 0	84	92	102	88	97	108	91	101	112	94	103	114	95	105	116	96	105	117
10	83	92	102	88	96	107	91	100	110	93	102	113	95	104	115	95	104	115
20	83	91	101	87	95	106	90	99	109	92	101	112	94	103	114	94	103	114
30	82	90	100	86	94	104	89	98	108	92	100	111	93	102	112	93	102	113
40	81	89	98	85	93	103	88	97	106	91	99	109	92	100	110			
50	80	88	97	84	92	101	87	95	105	89	97	107						
6 0	79	87	95	83	91	100	86	94	103	88	96	105						
10	78	85	94	82	89	98	84	92	101									
20	77	84	92	80	88	96	82	91	99									
30	75	82	90	79	86	94												
40	74	81	88	77	84	92												
50	72	79	86															
7 0	71	77	84															

(Concluded from preceding page.)

k	Lat. 72°			Lat. 66°			Lat. 60°			*k*	Lat. 72°			Lat. 66°			Lat. 60°		
	x′			*x′*			*x′*				*x′*			*x′*			*x′*		
	.62	.56	.50	.62	.56	.50	.62	.56	.50		.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	h m	m	m	m	m	m	m	m	m	m
9 50	14	16	18	18	20	22	22	24	26	11 0	7	8	8	9	10	11	10	11	12
10 0	13	15	16	17	19	21	20	22	24	10	6	6	7	7	8	9	9	9	10
10	12	14	15	16	17	19	19	21	22	20	5	5	6	6	6	7	7	8	8
20	11	12	14	15	16	17	17	19	20	30	3	4	4	4	5	5			
30	10	11	12	13	14	16	16	17	18	40	2	3	3	3	3	4			
40	9	10	11	12	13	14	14	15	16	50	1	1	1	1	2	2			
50	8	9	10	10	11	12	12	13	14	12 0	0	0	0	0	0	0			

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle H* gives the common geocentric hour angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the Besselian co-ordinate y at the same moment. Columns x' and y' give the hourly variation of x and y. The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed with three or four places of decimals by the formulæ,

$$\rho \sin \varphi' = G \sin \varphi$$
$$\rho \cos \varphi' = F \cos \varphi$$

already given in connection with the eclipses.

As in the case of eclipses, it is necessary to have an approximate time of the phenomena, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle at this same moment. Let us call this angle h_0, putting

$$h_0 = H - \lambda$$

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. The correction to reduce the time and hour angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. DOWNES's table on the last two pages. This correction will have the same sign as h_0.

When this table is not available, the correction may be computed thus: Compute the quantities ξ_0, ξ' and τ from the formulæ

$$\xi_0 = \rho \cos \varphi' \sin h_0$$
$$\xi' = [9.4192] \cos (h_0 + \tfrac{1}{3} h_0)$$
$$\tau = \frac{\xi_0}{x' - \xi'} \quad .$$

τ will then be the approximate interval between the times of geocentric and local conjunction. By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding and subtracting $0^h.5$ to the mean time of apparent conjunction, we shall have rough times of the phases of immersion and emersion for farther computation. Let us then put,

$$\tau_1 = \tau - 0^h.5$$
$$\tau_2 = \tau + 0^h.5$$

(2) Compute for the moments τ_1 and τ_2 the following quantities, in which we write τ for each of these quantities. The latter, when used as angles, are to be changed to arc by multiplying

by 15°, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$
\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + \tau) \\
\eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau) \\
\xi' &= [9.4192]\, \rho \cos \varphi' \cos (h_0 + \tau) \\
\eta' &= [9.4192]\, \rho \cos \varphi' \sin d \sin(h_0 + \tau) = [9.4192]\, \xi \sin d \\
x &= x'\tau \\
y &= Y + y'\tau.
\end{aligned}
$$

Compute m, M, n and N from the equations

$$
\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \zeta' \\
n \cos N &= y' - \eta' \\
n' &= \frac{n}{60} = [8.2218]\, n \\
\sin \psi &= [0.5650]\, m \sin (M - N)
\end{aligned}
$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) \mp \frac{[9.4350]}{n'} \cos \psi$$

$$t_2 = -\frac{m}{n'} \cos (M - N) \pm \frac{[9.4350]}{n'} \cos \psi$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the times $T + \tau$ to obtain the times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ, η, x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If $\log m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\cos \psi < 1$, or $\cos \psi > 1$. In the latter case, the impossible value of $\cos \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 0°$, or $180°$, according as $m \sin (M - N)$ is plus or minus; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n}$$

The distance from the moon's limb is then

$$\pi\, [m \sin (M - N) - k],$$

disregarding the sign of $m \sin (M - N)$; or, allowing for the augmentation of the semi-diameter,

$$\pi\, [m \sin (M - N) - k]\, [1 + z \sin \pi],$$

where $$z = A \cos (B - \delta')$$

4. Having found satisfactorily the times of immersion and emersion, and therefore N and ψ in each case, we have as the angle from the north point of the moon's limb, positive toward the east

$$Q = N - 90^\circ + \psi \quad \text{for an immersion,}$$
$$Q = N - 90^\circ - \psi \quad \text{for an emersion;}$$

and, taking

$$c \sin C = \xi + t\,\xi'$$
$$c \cos C = \eta + t\,\eta',$$

in which the last value of t for the particular phase is properly used, we have as the angle from the vertex of the moon's limb, or that point which is nearest the zenith,

$$V = Q - C$$

also reckoned positive in the same direction as Q, i. e., from north toward the east.

As an example of an isolated occultation we shall compute that of ν Geminorum, on 1882, January 3, as seen at the Royal Observatory, Greenwich, of which the position is—

$$\varphi = +\ 51^\circ\ 28'.6$$
$$\lambda = -\ \ 5^h\ 8^m.2$$

From (1) of eclipses we find,

$$\log \rho \sin \varphi' = 9.8913$$
$$\log \rho \cos \varphi' = 9.7953$$

From the table of elements, page 410 . . . . . . $H = -\ 11^h\ 10^m.8$

Hence, $h_0 = H - \lambda \quad = -\ \ 6^h\ \ 2^m.6$

From the table we find the corrections to apparent conjunction

for latitude $= 51^\circ$; $h_0 = 6^h$; $x' = 0.554$, to be 66^m.

Subtracting this from the time of geocentric conjunction, and then adding and subtracting half an hour, we have for the approximate Washington times, to be used in the computations,

Immersion, $\tau_1 = -\ 96^m = -\ 1^h.60$; $T =$ Jan. 2, $22^h\ 42^m.3$

Emersion, $\tau_2 = -\ 36^m = -\ 0^h.60$; $T =$ Jan. 2, $23^h\ 42^m.3$

	Immersion.	Emersion.
	h m	h m
h_0	− 6 2.6	− 6 2.6
τ, reduced to sidereal time	− 1 36.3	− 0 36.1
$h_0 + \tau$	− 7 38.9	− 6 38.7
$h_0 + \tau$ in arc	−114° 43′.5	−99° 40′.5
$\sin d$	+ 9.5399	+ 9.5399
$\cos d$	+ 9.9722	+ 9.9722
$\sin (h_0 + \tau)$	− 9.9583	− 9.9938
$\rho \cos \varphi' \sin d$	+ 9.3352	+ 9.3352
$\cos (h_0 + \tau)$	− 9.6214	− 9.2255
$\log \xi$	− 9.7536	− 9.7891
$\log \rho \cos \varphi' \sin d \cos (h_0 + \tau)$	− 8.9566	− 8.5607
$\log \rho \sin \varphi' \cos d$	+ 9.8635	+ 9.8635
$\log \rho \cos \varphi' \cos (h_0 + \tau)$	− 9.4167	− 9.0208
$\log \rho \sin \varphi' \sin d$	+ 9.4312	+ 9.4312
$\log \xi' = [9.4192]\, \rho \cos \varphi' \cos (h_0 + \tau)$	− 8.8359	− 8.4400
$\log \eta' = [9.4192]\, \rho \cos \varphi' \sin d \sin (h_0 + \tau)$	− 8.7127	− 8.7482

		Immersion.	Emersion.
$\rho \sin \varphi' \cos d$		+ 0.7303	+ 0.7303
$-\rho \cos \varphi' \sin d \cos (h_0 + \tau)$		+ 0.0905	+ 0.0364
η		+ 0.8208	+ 0.7667
$x = x' \tau$		− 0.8878	− 0.3329
ξ		− 0.5670	− 0.6153
$x - \xi$		− 0.3208	+ 0.2824
$y = Y + y' \tau$		+ 0.9395	+ 0.8730
η		+ 0.8208	+ 0.7667
$y - \eta$		+ 0.1187	+ 0.1063
x'		+ 0.5549	+ 0.5549
ξ'		− 0.0685	− 0.0275
$x' - \xi'$		+ 0.6234	+ 0.5824
y'		− 0.0665	− 0.0665
η'		− 0.0516	− 0.0560
$y' - \eta'$		− 0.0149	− 0.0105
$\log m \sin M$		− 9.5062	+ 9.4508
$\log m \cos M$		+ 9.0744	+ 9.0265
$\log \tan M$		− 0.4318	+ 0.4243
$\log n \sin N$		+ 9.7948	+ 9.7652
$\log n \cos N$		− 8.1732	− 8.0212
$\log \tan N$		− 1.6216	− 1.7440
M		− 69° 42′	+ 69° 22′
N		91 22	91 2
$M - N$		− 161 4	− 21 40
$\log \sin (M - N)$		− 9.5108	− 9.5673
$\log m$		9.5340	9.4796
$\log n$		9.7949	9.7653
$\log n'$		8.0167	7.9871
$\log \cos \psi$		− 9.6098	− 9.6119
$\log \cos (M - N)$		− 9.9759	+ 9.9682
$\log \frac{m}{n'}$		1.5173	1.4925
$\log \sin \psi$		9.9606	9.9602
$[9.4350] \div n'$		1.4183	1.4479
$-\frac{m}{n'} \cos (M - N)$		+ $\overset{m}{31.1}$	− $\overset{m}{28.9}$
$\frac{[9.4350]}{n'} \cos \psi$		± 23.9	± 25.6
t_1		+ 7.2	− 3.3
t_2 (inaccurate)		+ 55.0	− 54.5
Washington conjunction + τ		22 42.3	23 42.3
Washington mean time of phase	Jan. 2	22 49.5	23 39.0
$-\lambda$		+ 5 8.2	+ 5 8.2
Greenwich mean time of the phase	Jan. 3	3 57.7	4 47.2

These times may now be corrected in the way described for the eclipses, but for the purposes of prediction this correction need be executed only for the emersion.

For the position angles we have

	Immersion.	Emersion.
	° ′	° ′
$N - 90°$	1 22	1 2
ψ	114 2	114 9
Q	115 24	246 53

When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 410—446, gives H, the Washington hour-angle at the moment of geocentric conjunction, and the corresponding hour-angle at the place will be

$$h_0 = H - \lambda \qquad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition

$$\xi = x$$

or, using the values of ξ and x

$$\rho \cos \varphi' \sin h = x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In strictness, τ should here be multiplied by the factor $1 + \frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arising from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ is therefore,

$$\rho \cos \varphi \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is really obtained by successive approximation, and may be tabulated as a function of h_0 and x'. The computation of τ is effected as follows. We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \tfrac{1}{2}\tau \cos (h_0 + \tfrac{1}{2}\tau) \qquad (1)$$

The value of τ in arc being seldom more than 24° we may put τ itself for $2 \sin \frac{1}{2} \tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \tfrac{1}{2}\tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - k \rho \cos \varphi' \cos (h_0 + \frac{1}{2}\tau)} \qquad (2)$$

To tabulate τ, we must first have a table of the quantities

$$\left.\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916]\, \rho \cos \varphi' \cos h \end{aligned}\right\} \qquad (3)$$

which table may be formed for every 10 minutes (in time) of h. If we then put ξ_0 for the value of ξ corresponding to $h = h_0$, and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2}\tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \qquad (4)$$

Since we must know the value of τ, approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by computing values of τ for the two extremes of x', namely, $x' = 0.48$ and $x' = 0.60$, because the approximate values of τ can then be interpolated for all intermediate values of x'. For the first approximation may be taken—

$$\begin{aligned} \tfrac{1}{2}\tau &= 50^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \tfrac{1}{2}\tau &= 40^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \qquad (5)$$

or, the approximate values of τ may be taken from Mr. DOWNES's table, just given. It will be best to make the computation for every 30 minutes of h_0, and to find the intermediate values of τ_0 every 10^{m} by interpolation. Then for each 30^{m} of h_0 we will take ξ' from a table with the argument $h_0 + \frac{1}{2}\tau$, and log ξ with the argument h_0, and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^{m} from that employed in taking out ξ', a new value may be used to correct ξ', and the computation may be repeated. The values corresponding to $x'=0.51$, $x' = 0.54$, and $x' = 0.57$ can then be computed with the single interpolation of approximate values of τ, and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.62$. It will be best to compute τ in the first place to every 0.001 of an hour, and to drop the last figure in forming the definitive table. We shall call this Table I.

The values of η and of η' may then be tabulated for every degree of the star's declination, and every 10^{m} of h. It will not be really necessary to compute the table for negative values of d, since by putting

$$\begin{aligned} \eta_1 &= \rho \sin \varphi' \cos d \\ \eta_2 &= -\rho \cos \varphi' \sin d \cos h \end{aligned}$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d. But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

We shall call this table for η Table II, and the corresponding one for η' with the same arguments Table III. The precepts for using the tables will then be as follow:—

From Table I with the arguments x' and $H - \lambda = h_0$ take out the value of τ. It will be sufficient to use the nearest 0.01 of x'. τ will be of the same sign as h_0. Then, enter Table II with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η. Form the quantities $y = Y + y'\tau$, and $y - \eta$. If the latter quantity lies between the limits $\pm$ 0.28, it is almost certain that there will be an occultation. If it falls without the limits $\pm$ 0.33, it is almost certain that there will not be an occultation. Between the years 1881 and 1890 these last limits may be reduced to $\pm$ 0.32, and cases near this limit may be rejected if y' is small. A convenient rule to adopt will be—

$y' < 0.10$, limit $= \pm 0.29$
$10 < y' < 0.15$, limit $= \pm 0.30$
$15 < y' < 0.20$, limit $= \pm 0.31$
$20 < y'$ limit $= \pm 0.33$ or ± 0.32

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from their appropriate tables and compute

$$\begin{aligned} v \sin Q &= y' - \eta' \\ v \cos Q &= x' - \xi' \\ \Delta &= (y - \eta) \cos Q \end{aligned}$$

If $\Delta > 0.2723$ or $\log \Delta > 9.4350$ there will be no occultation, or, at best, the moon will only graze the star when $\Delta - 0.2723$ is very small. If $\Delta < 0.2723$, compute

$$\tau_1 = -\frac{y - \eta}{v} \sin Q \qquad \cos P = \frac{\Delta}{0.2723} \qquad (P < 180^\circ)$$

$$\tau_2 = \frac{0.2723 \sin P}{v}$$

We shall then have—

Local mean time of immersion, $T - \lambda + \tau + \tau_1 - \tau_2$
Local mean time of emersion, $T - \lambda + \tau + \tau_1 + \tau_2$

Position angle from north toward east at immersion, $Q + P$
Position angle from north toward east at emersion, $Q - P$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the Ephemeris, and select those which may be visible. The conditions of possible visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2 The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the day time.

The most convenient course will be to write the value of $-\lambda$ on the bottom of a sheet of paper, and, passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H - \lambda$ or $T - \lambda$ falls within the limits: in these cases, the computer had better mark the occultation for trial and leave the decision for the subsequent operations. The whole list can thus be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 450—481.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness.

Disks of Mercury and Venus, pages 450 and 451.—The angle θ, needed in reducing meridians, is the same as the position angle of the great circle drawn from the planet through the sun, diminished by 90°. This position angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star.

Satellites of Jupiter, pages 453—475.—The times of phenomena are explained at the foot of each page; the diagrams, on page 453.

Phenomena, pages 482 and 483.—The conjunctions, quadratures, etc., of the planets are in longitude, but the conjunctions of the moon with the planets are in right ascension.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

APPENDIX I.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1882.

The constants of precession, nutation, and aberration are those of Struve and Peters, namely:—

$$\begin{aligned}\text{Precession} &= 50''.2411 + 0''.0002268\,t\\ \text{Nutation} &= 9''.2231 + 0''.000009\,t\\ \text{Aberration} &= 20''.4451\end{aligned}$$

in which t is the number of years after 1800.0.

The obliquity of the ecliptic is that of Hansen's *Tables du Soleil*, which is 0″.32 greater than that of Peters, used in former issues of this Ephemeris. A comparison of Hansen's mean obliquity with that of Peters and Le Verrier at different epochs is given in the following table:—

Epoch.	Hansen.	Peters.	Le Verrier.	H.—P.	H.—L.
1750	23° 28′ 18″.19	17″.44	19″.42	+0″.75	−1″.23
1800	23 27 54.80	54.22	55.63	+0.58	−0.83
1850	23 27 31.42	30.99	31.83	+0.43	−0.41
1900	23 27 8.02	7.76	8.03	+0.26	−0.01

The formulæ for reduction of places of the fixed stars, page 280, correspond to the *Star Tables of the American Ephemeris*, Washington, 1869.

The mean right ascensions of stars have been reduced to Newcomb's fundamental standard, in the catalogue attached to the *Washington Observations for* 1870, Appendix II, with the following exceptions: The right ascensions of the 48 circumpolar stars north of 60° north declination are from Dr. Gould's *Standard Places of Fundamental Stars*, second edition, U. S. Coast Survey Office, 1866. Of the twelve stars south of 50° south declination, the positions of β Hydri, α Trianguli Australis, and σ Octantis, have been corrected from data furnished by Dr. Gould; while the remaining nine are, as before, from the *British Nautical Almanac* for 1848.

The right ascensions of additional stars in the general list, for which no apparent places are given in the subsequent section, have been taken partly from an unpublished investigation of the positions of the zodiacal stars, partly from the catalogue of the Astronomische Gesellschaft of 1878, and a few have been derived from recent catalogues without a rigorous reduction for equinox.

The mean declinations of stars are taken from Boss's paper in the *Report of the Northern Boundary Commission*, Washington, 1879, for all stars found therein. The declinations of all the other stars have been reduced to the same standard, except those of the additional ones above, which have been taken partly from the Astronomische Gesellschaft list, and partly from places in recent catalogues. To the apparent places of Sirius and Procyon have been applied the periodic corrections resulting from AUWERS's investigations.

The values of these corrections are: —

	Sirius.		Procyon.	
	s	″	s	″
1882.0	$\Delta \alpha = -0.052$	$\Delta \delta = -1.44$	$\Delta \alpha = -0.036$	$\Delta \delta = +0.90$
1883.0	$\Delta \alpha = -0.036$	$\Delta \delta = -1.43$	$\Delta \alpha = -0.026$	$\Delta \delta = +0.97$

The ephemeris of the sun* is constructed from HANSEN *and* OLUFSEN's *Tables du Soleil*, Copenhagen, 1853, except that STRUVE's aberration has been used. This is equivalent to adding 0″.19 to the longitudes, but does not affect the right ascensions and declinations. The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ: —

$$
\begin{aligned}
X &= R \cos \lambda \\
Y &= R \sin \lambda \cos \omega - 19.3\, R \beta \\
Z &= R \sin \lambda \sin \omega + 44.5\, R \beta
\end{aligned}
$$

The reductions to mean equinox, 1882.0, are computed by the formulæ,

$$
\begin{aligned}
\Delta X' &= + Y \sec \omega\, \Delta \lambda \\
\Delta Y' &= - X \cos \omega\, \Delta \lambda + \Delta \omega - 9.4\, \tau R \sin (\odot + 187^\circ) \\
\Delta Z' &= - X \sin \omega\, \Delta \lambda - Y \Delta \omega + 21.7\, \tau R \sin (\odot + 187^\circ)
\end{aligned}
$$

in which λ and β are the longitude and latitude of the sun referred to the equinox and ecliptic of the date; ω, the obliquity of the ecliptic; $\Delta \lambda$, the reduction of longitude for precession and nutation from January 0; $\Delta \omega$, the reduction of the mean to the apparent obliquity; and τ, the part of the year since January 0. The numerical coefficients are in units of the seventh place of decimals. The correction for latitude has been taken from GOETZE's paper in the *Astronomical Journal*, Vol. II, page 71.

The mean equatorial horizontal parallax of the sun, adopted from Professor NEWCOMB's *Investigation of the Distance of the Sun and the Elements which depend on it*,† is 8″.848. The adopted semidiameter of the sun at the earth's mean distance is 16′ 2″.

The ephemeris of the moon is constructed from PEIRCE's *Tables of the Moon*, *2d edition*, Washington, 1865. They include the *Tables of the Moon's Parallax* constructed from WALKER's and ADAMS's formulæ.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274\, \pi + 2''.5$$

The constant 2″.5 should be omitted in the computation of eclipses and occultations as due entirely to telescopic and ocular irradiation.

The ephemeris of Mercury is derived from Professor WINLOCK's *Tables of Mercury*, Washington, 1864. They are based on the older theory of LE VERRIER, published in the Additions to the *Connaissance des Temps* for 1848.

The ephemeris of Venus is derived from Mr. G. W. HILL's *Tables of Venus*, Washington, 1872.

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* From CARLINI's Tables, before 1858.

† *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1865, Appendix II.

The ephemeris of Mars is derived from manuscript tables constructed from LINDENAU's Tables. Mr. HUGH BREEN's results, contained in his paper *On the Corrections of* LINDENAU's *Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX, have also been discussed and applied; and LE VERRIER's secular variations of the elements are likewise adopted. The following are the corresponding corrected elements and annual variations for Washington, 1855.0:—

$$\begin{array}{lrl}
L = 320^\circ\ 13'\ 33''.87 & + & 689101''.1527\ t \\
\pi = 333\ 23\ 17.84 & + & 65.9990\ t \\
\Omega = 48\ 25\ 55.29 & + & 27.6997\ t \\
i = 1\ 51\ 2.20 & - & 0.02141\ t \\
e = 19238''.75 & + & 0.18549\ t \\
n = 689050''.8927 & & \\
a = 1.5236915 & &
\end{array}$$

The ephemeris of Jupiter is derived from manuscript tables constructed from BOUVARD's Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The ephemeris of Saturn is derived from BOUVARD's Tables. The perturbations produced by Jupiter, and the change of the Great Inequality since 1840, have been increased by $\frac{1}{50}$ of their value. ADAMS's Table, in the *British Nautical Almanac* for 1851, has been substituted for BOUVARD's Table XLII. The following corrections of the elements for 1855.0 have also been introduced:—

Correction of mean longitude $= + \ 4''.9$

Correction of longitude of node $= - \ 143.0$

Correction of inclination $= - \ 5.7 + 0''.0149\ t$

The ephemeris of Uranus and that of Neptune are derived from Professor NEWCOMB's Tables, published by the *Smithsonian Institution*.

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3''.34	0.00	LE VERRIER, *Theory of Mercury*.
Venus	8.546 ± 0.086	0.00	PEIRCE, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars (polar)	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The eclipses of Jupiter's satellites are computed from TODD's *Continuation of* DAMOISEAU's *Tables*, Washington, 1876. The occultations, transits, etc., are computed from WOOLHOUSE's Tables, *British Nautical Almanac* for 1835, Table II of each satellite having been adapted to DAMOISEAU's Tables.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables by Professor NEWCOMB. The apparent elements of the rings of Saturn are computed from BESSEL's data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are prepared from the data of Professor NEWCOMB's *Uranian and Neptunian Systems*, Washington, 1875.

The elements of eclipses of the sun and occultations of stars by the moon are adapted to Bessel's method, using the special forms in Chauvenet's *Spherical and Practical Astronomy.*

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the Directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris. The following results of Dr. Albrecht's adjustment, *Astronomische Nachrichten*, Band 95, col. 129, have also been adopted: —

	m	s
Berlin—Greenwich	− 53	34.908
Berlin—Paris	− 44	13.883
Berlin—Vienna	+ 11	46.312
Berlin—Altona	− 13	48.555
Berlin—Wilhelmshaven	− 20	59.700
Berlin—Leiden	− 35	38.557
Berlin—Bonn	− 25	11.615
Berlin—Manheim	− 19	44.392
Berlin—Strassburg	− 22	30.206
Berlin—Munich	− 7	8.778
Berlin—Leipzig	− 4	0.891
Berlin—Göttingen	− 13	48.666

The reduction to geocentric latitude, and the logarithm of the radius of the earth are computed from the elements of the terrestrial spheroid derived by Bessel.

$$\log e = 8.9122052$$

$$\varphi' - \varphi = - 11' \, 30''.65 \sin 2\varphi + 1''.16 \sin 4\varphi$$

$$\log \rho = 9.9992747 + 0.0007271 \cos 2\varphi - 0.0000018 \cos 4\varphi$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—

(1) An altitude of Polaris equal to 45°.
(2) A declination of Polaris equal to + 88° 41′ 5″.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^h\,16^m.0$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 302—304.

The principal computations of the Ephemeris have been distributed in the following manner: —

The sun has been computed by Mr. Eastwood; the moon's longitude, latitude, semidiameter and horizontal parallax, by Professor Keith; right ascension and declination, by Professor Van Vleck; culminations, by Professor Runkle; lunar distances, by Mr. W. B. Oliver; Mercury and Venus, by Mr. Austin; Mars and Uranus, by Mr. Ferrel; Jupiter and Jupiter's satellites, by Professor Kendall; Saturn, by Mr. G. W. Hill; Neptune, by Mr. Wiessner; the fixed stars have been prepared by Mr. Wiessner, Mr. Loomis, and Dr. Townsend; the general constants for their reduction, by Mr. Ferrel; the occultations, by Mr. Downes assisted by Mr. Wiessner; and the eclipses have been computed and the charts projected by Professor Keith.

APPENDIX II.

CHANGES INTRODUCED INTO THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1882.

IN the Autumn of 1877, the propriety of making such changes in the contents of *The American Ephemeris and Nautical Almanac*, as might be suggested by twenty-five years of use, was taken into consideration by the Superintendent. The necessary use of two distinct meridians, that of Greenwich and that of Washington, produced a want of symmetry which it was desired to reduce to the minimum. It was thought that this would be best attained by giving all astronomical data which are required for equidistant intervals of time, irrespective of any special meridian for Greenwich mean noon; and by reducing the Washington Ephemeris to one for transits over the meridian of Washington. An exception, however, had to be made in the case of the constants for the reduction of the fixed stars, which it was judged best to continue giving for Washington midnight.

A list of the changes which seemed advisable having been prepared by the Superintendent, a circular was sent to astronomers and others, requesting their opinion upon them, and their suggestions respecting farther improvements. This list as originally proposed was as follows:—

SUGGESTED CHANGES IN THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

No radical change is suggested in the general arrangement of the Almanac, nor in the principles had in view when this arrangement was devised. These general principles, as it is now proposed to put them into practice, may be enunciated as follow:—

1. The places of the sun, moon, and seven principal planets should be given for convenient equidistant intervals of time. Heretofore, the positions of some of these bodies have been given for Greenwich noon, of others for Washington noon, and of yet others for both Greenwich and Washington noon. In order to introduce uniformity into the Ephemeris, it is proposed to give all these quantities for Greenwich noon exclusively, or for $18^h\ 51^m\ 48^s$, Washington mean time. It is believed that this course will be productive of no inconvenience whatever.

2. To give the positions of all these bodies for transit over the meridian of Washington. During the last fifteen years the position of the moon has not been so given.

3. To give all phenomena to be observed in Washington mean time. This has always been the course in the preparation of the Ephemeris.

In general conformity with these principles, the following are the suggested changes in detail:—

(1) To preserve the general form and arrangement of the navigator's part of the Almanac, pages 1 to 241, but to add ephemerides of Mercury, Uranus, and Neptune. It may be sufficient to give the ephemerides of the two latter planets for every fourth or fifth day.

(2) To add the heliocentric longitude, latitude, and radius vector of all the planets, and their distance from the earth; those of Mercury for every day or every other day; those of the other planets for every fourth or fifth day.

(3) To add the sun's rectangular co-ordinates for every Greenwich mean noon. The question whether they should also be given for midnight, and whether the reductions to the mean equinox for the beginning of the year should be added, is one on which the opinions of astronomers who use the Almanac are desired.

(4) Pages 249—251. Omit BESSEL's day numbers entirely. These quantities can be used only when the like corresponding quantities are computed for the star to be reduced, and these quantities are good for so short a time when entire accuracy is required that it is seldom worth while to compute them. Another reason for the omission is found in the confusion which may arise from the difference between the systems of notation adopted in different catalogues. The independent constants *f*, *g*, etc., being given for every day, may supersede the others.

(5) Pages 330—332. Add moon's right ascension, declination, horizontal parallax, and semidiameter for transit over the meridian of Washington.

(6) Pages 333—336. Add to the list of moon-culminating stars the places of stars occulted by the moon.

(7) Pages 337—340. Omit moon's parallax and semidiameter, both being already given for Greenwich noon and Washington transit.

(8) Pages 344—385. Omit all data for Washington noon, and the Diff. for 1^h of Longitude, leaving only mean time of transit, and right ascension and declination at transit. There will be room on the page to add semidiameter and horizontal parallax, each to be given for every third day. These data to be limited to times when the transit can be observed.

(9) Pages 388—399. Omit sun's co-ordinates for Washington noon and midnight, they being given for Greenwich. (See 3).

(10) Pages 400—406. Omit these co-ordinates entirely.

(11) Pages 408—414. The question whether HANSEN's eclipse-formulæ can advantageously replace those of BESSEL is one on which opinions are requested.

(12) Pages 415—448. Restrict predicted occultations to stars of the sixth magnitude (perhaps the fifth) except in case of clusters, and, perhaps, occultations visible in the United States.

(13) Pages 468—473. Omit these tables, and add diagrams by which the positions of the satellites at any time can be found by sight.

(14) Page 474. Give more complete data for defective illumination of planets.

(15) Add data respecting satellites of Saturn, Uranus, and Neptune.

The answers to this request were quite uniform in sustaining the advisability of most of the changes; but several modifications being proposed, and some differences of opinion manifested, it was judged best to refer the whole matter to the National Academy of Sciences. A committee of the Academy was appointed by request of the Honorable Secretary of the Navy, which, after a careful consideration of the subject, made the following report:—

Report of a Committee of the National Academy of Sciences, appointed at the request of the Secretary of the Navy, on certain proposed changes in the American Ephemeris and Nautical Almanac, suggested by Professor NEWCOMB.

The committee held a meeting on January 15th, 1878, at the Office of the Nautical Almanac, in Washington, at which Professor NEWCOMB, the Superintendent of the Nautical Almanac, was present and took part in the discussion. Members present, Messrs. HILGARD, COFFIN, HALL, and SCHOTT. A full discussion of each of the questions, submitted to the consideration of the committee, was had, during which the answers received from various astronomers, in reply to Professor NEWCOMB's circular, were combined and considered.

The following conclusions were unanimously consented to, which it was voted should be submitted to the absent members before being formally adopted. Their approval having been received, the report is now respectfully submitted.

Referring to the printed paper headed "*Suggested Changes in the American Ephemeris and Nautical Almanac*," a copy of which is attached, the three general propositions, 1, 2, and 3, are approved.

Of the proposed changes in detail, those marked (1), (2), and (3), also were agreed to.

(4) It is recommended that for the present the "BESSEL" day numbers should continue to be given.

(5) (6) (7) (8) (9) and (10) are approved.

(11) BESSEL's original eclipse formulæ are recommended on account of their perspicuity, neither SAFFORD's modification nor HANSEN's treatment presenting any material advantage.

(12) (13) (14) and (15) are assented to.

With regard to (13), the Committee recommended the use of diagrams similar to those given in the *British Nautical Almanac;* but, if practicable, showing the places of each satellite connected by curves.

The Committee further recommend a considerable increase in the number of fixed stars, for which mean places and apparent places at transit are given—with a view to facilitating observations of time and their computations.

J. E. HILGARD, JAMES C. WATSON,
CHAS. A. SCHOTT, C. H. F. PETERS,
J. H. C. COFFIN, CHAS. A. YOUNG.
ASAPH HALL,

These recommendations have been carried out in the present volume with perhaps one or two slight modifications. A separate list of moon-culminating stars has not been given, it being judged that the field observer, for whose use they were primarily designed, could readily select suitable stars from the extended star list on pages 293—301.

The mean places of stars occulted by the moon have also been omitted, because positions sufficiently accurate to be regarded as definitive are not yet completely worked out. It is hoped that this will be done in the course of the year; and that, hereafter, accurate positions of all stars occulted by the moon will be given.

After a careful study of many plans of representing the configurations of the satellites of Jupiter, it was found that no material improvement could be easily made in the method employed in European ephemerides. This method has therefore been adopted.

The Washington mean times of geocentric conjunctions of the satellites of Jupiter have been retained.

TABLE I.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

Approximate Interval.		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54 718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Side-real.	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	$8^{\text{h.}}$	$9^{\text{h.}}$	$10^{\text{h.}}$	$11^{\text{h.}}$	$12^{\text{h.}}$	$13^{\text{h.}}$	$14^{\text{h.}}$	$15^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Sidereal.	$8^{\text{h.}}$	$9^{\text{h.}}$	$10^{\text{h.}}$	$11^{\text{h.}}$	$12^{\text{h.}}$	$13^{\text{h.}}$	$14^{\text{h.}}$	$15^{\text{h.}}$	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Sidereal.	$16^{h.}$	$17^{h.}$	$18^{h.}$	$19^{h.}$	$20^{h.}$	$21^{h.}$	$22^{h.}$	$23^{h.}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162
Mean Solar.	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8h.	9h.	10h.	11h.	12h.	13h.	14h.	15h.	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	8h.	9h.	10h.	11h.	12h.	13h.	14h.	15h.	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	For Seconds.	

TABLE IV.—LATITUDE BY POLARIS.

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to local sidereal time.

If the sidereal time is
- less than $1^h\ 16^m.0$, subtract it from $1^h\ 16^m.0$;
- between $1^h\ 16^m.0$ and $13^h\ 16^m.0$, subtract $1^h\ 16^m.0$ from it;
- greater than $13^h\ 16^m.0$, subtract it from $25^h\ 16^m.0$;

and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV, and add it to or subtract it from the true altitude, according to its sign. The result is the latitude of the place.

Example.—1882, November 10, at $9^h\ 26^m\ 26^s$, P. M., mean solar time, in longitude 26° east of Greenwich, suppose the true altitude of Polaris to be 26° 26′: required the latitude of the place.

	h m s
Local astronomical mean time	9 26 26
Reduction from Table III, for $9^h\ 26^m\ 26^s$	+ 1 33
Greenwich sidereal time of mean noon, November 10, page 183 .	15 18 10
Reduction from Table III, for longitude ($= 1^h\ 44^m$ east, or minus)	— 0 17
Sum (having regard to signs) equals local sidereal time . .	0 45 52 $= 0^h\ 45^m.9$
	1 16.0
Subtract sidereal time	0 45.9
Remainder equals hour-angle of Polaris	0 30.1

	° ′
True altitude	+ 26 26.0
Correction from Table IV. . . .	— 1 18.2
Sum equals latitude	+ 25 7.8

TABLE IV—1882.

Hour-Angle.	0h.		1h.		2h.		3h.		4h.		5h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	− 1 18.9	0.0	− 1 16.2	0.5	− 1 8.1	0.9	− 0 55.4	1.3	− 0 38.8	1.5	− 0 19.5	1.6
5	1 18.9	0.1	1 15.7	0.5	1 7.2	0.9	0 54.1	1.2	0 37.3	1.6	0 17.9	1.7
10	1 18.8	0.1	1 15.2	0.5	1 6.3	1.0	0 52.9	1.3	0 35.7	1.5	0 16.2	1.7
15	1 18.7	0.1	1 14.7	0.6	1 5.3	1.0	0 51.6	1.4	0 34.2	1.6	0 14.5	1.7
20	− 1 18.6	0.2	− 1 14.1	0.6	− 1 4.3	1.0	− 0 50.2	1.3	− 0 32.6	1.6	− 0 12.8	1.7
25	1 18.4	0.2	1 13.5	0.7	1 3.3	1.0	0 48.9	1.4	0 31.0	1.6	0 11.1	1.8
30	1 18.2	0.2	1 12.8	0.7	1 2.3	1.1	0 47.5	1.4	0 29.4	1.6	0 9.3	1.7
35	1 18.0	0.3	1 12.1	0.7	1 1.2	1.1	0 46.1	1.4	0 27.8	1.6	0 7.6	1.7
40	− 1 17.7	0.3	− 1 11.4	0.8	− 1 0.1	1.1	− 0 44.7	1.4	− 0 26.2	1.7	− 0 5.9	1.7
45	1 17.4	0.4	1 10.6	0.8	0 59.0	1.2	0 43.3	1.5	0 24.5	1.6	0 4.2	1.7
50	1 17.0	0.4	1 9.8	0.9	0 57.8	1.2	0 41.8	1.5	0 22.9	1.7	0 2.5	1.8
55	1 16.6	0.4	1 8.9	0.8	0 56.6	1.2	0 40.3	1.5	0 21.2	1.7	− 0 0.7	1.6
60	− 1 16.2		− 1 8.1		− 0 55.4		− 0 38.8		− 0 19.5		+ 0 0.9	

Hour-Angle.	6h.		7h.		8h.		9h.		10h.		11h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	+ 0 0.9	1.7	+ 0 21.3	1.7	+ 0 40.1	1.5	+ 0 56.3	1.2	+ 1 8.6	0.8	+ 1 16.3	0.4
5	0 2.6	1.8	0 23.0	1.6	0 41.6	1.4	0 57.5	1.1	1 9.4	0.8	1 16.7	0.4
10	0 4.4	1.7	0 24.6	1.6	0 43.0	1.5	0 58.6	1.2	1 10.2	0.8	1 17.1	0.4
15	0 6.1	1.7	0 26.2	1.6	0 44.5	1.4	0 59.8	1.1	1 11.0	0.7	1 17.5	0.3
20	+ 0 7.8	1.7	+ 0 27.8	1.6	+ 0 45.9	1.4	+ 1 0.9	1.0	+ 1 11.7	0.7	+ 1 17.8	0.3
25	0 9.5	1.7	0 29.4	1.5	0 47.3	1.3	1 1.9	1.1	1 12.4	0.7	1 18.1	0.2
30	0 11.2	1.7	0 30.9	1.6	0 48.6	1.4	1 3.0	1.0	1 13.1	0.6	1 18.3	0.2
35	0 12.9	1.7	0 32.5	1.6	0 50.0	1.3	1 4.0	0.9	1 13.7	0.6	1 18.5	0.1
40	+ 0 14.6	1.7	+ 0 34.1	1.6	+ 0 51.3	1.4	+ 1 4.9	1.0	+ 1 14.3	0.6	+ 1 18.6	0.1
45	0 16.3	1.7	0 35.7	1.5	0 52.7	1.2	1 5.9	1.0	1 14.9	0.5	1 18.7	0.1
50	0 18.0	1.6	0 37.2	1.5	0 53.9	1.1	1 6.9	0.8	1 15.4	0.4	1 18.8	0.1
55	0 19.6	1.7	0 38.7	1.4	0 55.0	1.3	1 7.7	0.9	1 15.8	0.5	1 18.9	0.0
60	+ 0 21.3		+ 0 40.1		+ 0 56.3		+ 1 8.6		+ 1 16.3		+ 1 18.9	